STC

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Technical COMMUNICATION

Journal of the Society for Technical Communication

CONTEXTS OF TECHNICAL COMMUNICATION

- ANALYSIS OF INDUSTRY JOB POSTINGS
- VISUALIZING A NON-PANDEMIC
- APP ABROAD AND MUNDANE ENCOUNTERS
- TRANSLATION AS A USER-LOCALIZATION PRACTICE

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Technical Communication is a peer-reviewed, quarterly journal published by the Society for Technical Communication (STC). It is aimed at an audience of technical communication practitioners and academics. The journal's goal is to contribute to the body of knowledge of the field of technical communication from a multidisciplinary perspective, with special emphasis on the combination of academic rigor and practical relevance.

Technical Communication publishes articles in five categories:

- **Applied research** – reports of practically relevant (empirical or analytical) research
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Kirk St.Amant, Guest Editor

Re-Thinking the Context of Technical Communication

It's been said that the only thing that is constant is change. While this situation might be true, that does not mean we shouldn't stop every now and then to assess where we are at a given point in time. This checking the current context is important for a number of reasons. First, it can help us determine where we've been and why. Second, it can help us better understand where we are now and how we got here. And finally – and perhaps, most importantly – it can help us plan where we might go next. It all sounds so simple. Yet, in an age of globalization, social media, and rapid economic change, such contexts checks can seem incredibly complex – if not overwhelming. After all, what do we focus on? How do we examine it? And how can topics we review now provide us with insights for the future?

These questions are not easy ones. However, that doesn't mean we shouldn't look for answers. It all starts with the process of thinking about – or perhaps *re-thinking* – the current context we are in and, based on such reflection, where we wish to be in the future.

One way to start this process is to look for themes or concepts to reflect upon. Such themes might be relatively broad in nature (for example, the context of the current job market) or more narrow in scope (for example, using visuals to convey data about risk). The key to selecting such themes is the potential they have to influence approaches and perceptions in our overall field. By examining such themes, we – as technical communicators – can re-think our perspectives of where we are at this point in time – the current context – and consider how technical communication might evolve in the future.

This guest-edited issue represents just that – an initial look at current themes that could affect practices and perspectives in the years to come. These entries also represent members of the field who wish to examine such themes at different points in their respective technical communication careers. These authors include more established researchers in the field, researchers who are just beginning their careers, and graduate students starting their studies. What all of these individuals have in common is an interest in exploring the current context of technical communication to help us consider how the field might evolve in the future. The perspectives they provide offer us, as technical communicators, topics to consider as we re-think where the field currently is and reflect upon where it may be headed.

To begin, what does it mean to be a technical communicator in the current workplace context? What kinds of knowledge and skills should one have to succeed in the field today – and in the future?

The first entry in this issue, the article, "The Evolution of Technical Communication: An Analysis of Industry Job Postings" examines this idea. In it, Eva Brumberger and Claire Lauer present an analysis of recent job postings to try to determine what employers are looking for when they hire a technical communicator. To do so, Brumberger and Lauer reviewed roughly 1,000 job ads posted for a 60-day period in 2013. Their goal was to determine how organizations perceive technical communicators – who they are and what they do – when staffing positions. The results of their research provide important insights on how we might re-think what the field means to employers in this current context. These results also have important implications for how we might re-think technical communication education in terms of preparing students for both the current job context as well as that of the future.

A second aspect to consider is the context in which we share information. Often, technical communicators design materials for a specific audience. But in an age of global online media, who is our audience, and what implications are there for how different populations interpret and react to information? Candice A.

Welhausen examines these ideas in her entry "Visualizing a Non-Pandemic: Considerations for Communicating Public Health Risks in Intercultural Contexts." In this piece, Welhausen reviews images the *New York Times* used to convey aspects of risk (specifically, the 2014 Ebola outbreak) to readers. In so doing, she notes that the global reach of modern media means seemingly local presentations of information can easily reach broader international audiences. Through her analysis of this particular case, Welhausen prompts us to re-think how we view ideas of audience – and approaches to sharing information with audiences – according to the continually evolving context created by the global spread of online media.

The technologies we use to interact greatly affect our understanding of audience and design. They also affect how we think about the context in which we research such topics. If new forms of media are continually changing the nature of our interactions, what approaches can we use to re-think the research we do to better understand audiences? This idea of researching audiences is central to Benjamin Lauren's article "App Abroad and Mundane Encounters: Challenging How National Cultural Identity Heuristics are Used in Information Design." In this piece, Lauren examines how technical communicators can use different applications – or apps – to conduct research on audiences from other cultures. By examining this topic, Lauren also looks at how different kinds of interactions – such as study abroad experiences – can create a new context for thinking about and conducting research on users. Lauren's approach prompts us to re-think both the context in which we can do research and the technologies we might use to do so.

A final item to consider is how we think of collaboration in our current context. Many technical communication activities, for example, require individuals to work together to produce a final product. One such collaborative activity is that of generating translations – a process in which technical communicators and translators often collaborate to produce documentation in different languages. In such situations, perceptions of what translators do affect how technical communicators think about the translation process. In this final entry, Laura Gonzales and Rebecca Zantjer's "Translation as User-Localization Practice," asks readers to re-think approaches to conveying meaning across languages. In particular, Gonzales and Zantjer note that, sometimes, the process of communicating ideas in other languages involves both verbal and nonverbal factors. Their research, which looks at how bilinguals convey ideas in translation situations, offers insights that can prompt technical communicators to re-think their perceptions of the translation process (and collaborating with translators). These insights can also prompt technical communicators to re-think how they interact with international colleagues who might be working across languages to share information and exchange ideas.

The themes examined in these four entries appear to be deceptively simple. Each article, however, addresses a larger idea that affects how we think about the current context in which technical communication takes place. Likewise, each of these themes merits reflection – or re-thinking – to consider how we, as a field, might be affected by and thus approach them in the future. Current job postings, for example, provide a valuable context for re-thinking approaches to education to better prepare future generations to be successful members of the field. Similarly, examining the notion of audience in the current context of online global media can help us, as a field, re-think approaches to sharing information in ways that can facilitate international interactions. Re-thinking research in terms of the technologies used and the contexts in which research takes place can provide new approaches to usability and lead to designs that better suit the needs of specific groups of users. And re-thinking translation from a context that is more holistic (that is, verbal and visual) can help us collaborate in different ways in the context of the modern – and future – global economy.

That said, the purpose of this issue is not to be a definitive collection of articles on the most important issues currently facing technical communicators. Rather,

these entries should be viewed as starting points to prompt technical communicators to re-think the current context in which we work. Ideally, these starting points can lead to larger discussions of what the current context of our field is and challenge us to re-think current practices with an eye to how the field might change in the future.

It is true; change is constant. Therefore, we need to continually re-think our current context to be better prepared for such change.

About the Guest Editor

Kirk St.Amant is a professor of Technical and Professional Communication and of International Studies at East Carolina University. His areas of research include international/intercultural communication, international aspects of online education, and health and medical communication in global contexts. He is available at kirk.stamant@gmail.com.

The Evolution of Technical Communication: An Analysis of Industry Job Postings

By Eva Brumberger and Claire Lauer

Abstract

Purpose: This article extends earlier studies examining the core competencies of technical communicators. Our project updates these previous perspectives by analyzing the broad range of information products, technologies, professional competencies, and personal traits requested by industry job advertisements. The analysis seeks to answer three main questions:

- What genre/information product knowledge is important for success in the technical communication job market?
- What technology skills are essential for success in the technical communication job market?
- What professional competencies and personal characteristics are essential for success in the technical communication job market?

Method: We analyzed almost 1,000 U.S. technical communication job postings from Monster.com. We mined the postings for position title, job type, education level, experience level, location, salary, and industry sector. We subsequently conducted a content analysis of the job descriptions, using open coding to identify information products, technologies, professional competencies, and personal characteristics.

Results: The job postings exhibited enormous variety in position titles but fell into five main categories: Content Developer/Manager, Grant/Proposal Writer, Medical Writer, Social Media Writer, and Technical Writer/Editor. Information products and technology skills varied substantially with job type. The job postings showed some differentiation in professional competencies across job categories, but they also revealed competencies that were common to all categories.

Conclusion: Technical communication positions now encompass a wide range of audiences, content, contexts, and media. The jobs data illustrate the breadth of products and competencies that drive the field.

Keywords: Job postings, information products and genres, technologies, core competencies, industry snapshot

Practitioner's Takeaway

- Extends previous studies of core competencies and provides empirical support for the continued expansion of technical communication.
- Offers up-to-date understanding of the technical communication jobs landscape and the professional competencies, personal characteristics, information products, and technologies that are most sought after by hiring managers.
- Provides valuable workplace data for those in academia who are engaged with ongoing efforts to keep curricula current and relevant.

Introduction

> Technical writers, also called *technical communicators*, prepare instruction manuals, journal articles, and other supporting documents to communicate complex and technical information more easily. They also develop, gather, and disseminate technical information among customers, designers, and manufacturers. (Bureau of Labor Statistics)

This is the most recent (2014-2015) description of technical communication offered by the Bureau of Labor Statistics in the *Occupational Outlook Handbook*. Similarly, the Occupational Information Network (O*NET) notes that technical communicators, "Write technical materials, such as equipment manuals, appendices, or operating and maintenance instructions" and "May assist in layout work" (http://www.onetonline.org/link/summary/27-3042.00). What is remarkable about both of these descriptions is that they portray the work of technical communication in terms of more traditional genres and notions of "writing."

In contrast to these more traditional depictions of the field, practitioners and academics take the position that technical writers are not—and have not been for some time—just writers. The trend toward a greater variety of workplace roles was reported by numerous scholars as early as the 1990s (see, for example, Zimmerman & Long, 1993; Whiteside, 2003), and changes in technologies and composing practices over the past ten years have further broadened the scope of technical communication work (Albers, 2005; Dicks, 2009; Giammona, 2009; Giordano, 2011).

However, the field does not have data that can provide a current snapshot of the technical communication workplace and can identify patterns in job requirements. We know that today's technical communicators need knowledge and skills not only in written communication, but also in information design, multimodal communication, and in a range of tools and technologies (multimodal texts as those that "exceed the alphabetic and may include still and moving images, animations, color, words, music and sound" (Selfe & Takayoshi, 2007, p. 1). But, we don't have up-to-date, empirical evidence to help practitioners and new graduates position themselves effectively within the technical communication market. As Kimball (2015) noted, "What we do, what we call ourselves, how we form and encourage the development of new members of our profession—all have changed so quickly that we must constantly reassess where we stand, what we do, and who we are as technical communicators" (p. 89).

The purpose of this article is to present the findings of an extensive analysis of U.S. industry job postings. We analyzed almost 1,000 job ads collected during a 60-day period from September to November of 2013; we examined the competencies and characteristics that employers are seeking of applicants, as well as patterns in job titles and types, experience and education levels, industry sectors, locations, and salaries. In this article, we argue that the data emphasize not only the breadth of competencies required of today's technical communicators, but also the wide range of career options now available to existing practitioners and new graduates who know how to articulate their qualifications in light of these changes.

We begin with a brief overview of past research that has addressed technical communication competencies. We then discuss our methodology, including how we collected and analyzed the data. We present the study results in four main areas: genre/information product knowledge, tools/technologies, professional competencies, and personal characteristics. Finally, we discuss the implications of the data for practitioners and academic programs.

Past Research

Several studies have looked at workplace expectations and responsibilities in technical communication. These include

- Rainey, Turner & Dayton (2005), who collected data from technical communication managers,
- Lanier (2009), who analyzed job postings for technical writers, and
- Blythe, Lauer, and Curran (2014), who reported on the results of a survey of graduates of professional writing programs.

Collectively, these prior studies present a range of perspectives from managers, job postings, and graduates, and we examine these perspectives in more detail in this section.

Evolution of Technical Communication

Managers' Perceptions

Rainey, Turner and Dayton (2005) surveyed technical communication managers to identify core competencies for technical communicators; the survey was completed by 67 managers from a range of industries and locations. Respondents rated competencies on a Likert scale, according to the perceived importance of those competencies to the day-to-day work of the technical communicator; competencies included capabilities that have traditionally been termed "soft skills," such as writing and collaboration, as well as "hard skills," such as facility with various types of technology. The most essential skills overall were the ability to collaborate with subject-matter experts and co-workers and the ability to write clearly for specific audiences and purposes. Also highly ranked were the ability to analyze user needs; utilize word-processing and document-design software; learn to assess and use new technology; and motivate, critique, and evaluate oneself. Managers indicated that the most prevalent information products produced by their technical writers were PDF documentation and hard-copy documentation, followed by online help, style guides, online reference material, Web pages, and training materials.

Overall, the data collected by Rainey, Turner, and Dayton (2005) paint a picture of the field that reflects well-established technical communication processes and products, with the addition of online help and Web pages. Their data provide a valuable baseline for looking at the core skills and competencies of technical communicators; however, the study is over ten years old.

More recent data that reflect the perceptions of managers were reported by Kimball (2015), Baehr (2015), and Dubinsky (2015). As Kimball describes, their collaborative study examined "what technical communication is today, how it works, and who does it, from the perspective of the people who manage technical communication practitioners in successful, highly prominent companies" (p. 89). However, the data resulting from this work reflect the perceptions of only eight managers (fewer at the conclusion of the study) rather than actual job requirements or perceptions of those who are actually technical communicators.

Technical Writing Job Postings

Lanier (2009) contributes a second valuable perspective on the skills required of technical communicators in the workplace. Rather than gathering data from managers, Lanier identified competencies by analyzing job postings collected from Monster.com during a three-month period in 2006. He focused specifically on the knowledge and skills required of technical communicators who were new to the field, restricting his analysis to job postings that required a maximum of two years of technical communication experience. Lanier also excluded jobs that required a specialized technical degree (for example, engineering) and those that included no information about the industry home of the job. Finally, and perhaps most significantly, his analysis examined only job postings for which the job title was "technical writer."

Lanier ultimately reported on an analysis of 327 job postings. He found that by far the most important competency was communication skills. Employers also tended to expect some level of genre familiarity—knowledge of particular types of information products, such as online help. Lanier reported that subject matter familiarity was called for in many of the job postings. Finally, he noted that technology skills (for example, publishing, graphics, and online help tools) appeared to be more important than indicated by earlier studies.

Like Rainey, Turner, and Dayton (2005), Lanier's study offers valuable insights about core competencies for technical communicators. His methodology is particularly useful for gathering details about employer expectations for new hires. However, the data are now several years out of date, and the field has broadened significantly in that time.

Professional and Technical Writing Graduates

The third valuable perspective that informed our study is that of professional and technical writing graduates who have joined the workforce. Blythe, Lauer, and Curran (2014) reported on the results of a nationwide survey of technical and professional communication alumni regarding the kinds of writing they engaged in, the kinds of writing they valued the most, and the technologies they used. The survey had 257 respondents who had graduated from their respective programs an average of seven years prior to when they took the survey.

The most common information products alumni reported producing were instructions/manuals, Web sites, and presentations, followed by definitions, social media, and grants/proposals (Blythe, Lauer & Curran, 2014, p. 273). Respondents reported that the software tools they most commonly used for this work included

word processing, image editing, and desktop publishing software. Also commonly used were social networking, wiki, and blogging tools, and presentation software (pp. 276-277).

Blythe, Lauer, and Curran asked respondents to connect their writing with the genres, locations, collaborators, audiences, and tools they used to complete it. This more holistic perspective complements and builds upon the earlier work done by Rainey, Turner, and Dayton (2005) and Lanier (2009). It also represents the most up-to-date information the field has about the writing work that alumni are doing in and out of the workplace, especially accounting for mobile, Web, and social media writing in ways that previous studies were unable to do. However, Blythe, Lauer, and Curran's research (2014) does not specifically address core competencies for technical communication nor the personal character traits professional and technical writing employers are seeking in their applicants.

Summary

Although the studies reported here offer valuable perspectives on the competencies and genres that form the core of technical communication, they do not provide an up-to-date, large-scale, comprehensive look at the field. Our project seeks to further extend and update these previous perspectives.

Methodology

The goal of our study was to examine the current range of skills, competencies, products, and traits requested of technical communicators in the workplace. We began the study with three main research questions regarding success in the technical communication job market:

- What genre/information product knowledge is important?
- What technology skills are essential?
- What professional competencies and personal characteristics are necessary?

To address these questions, we utilized a method similar to Lanier (2009), in that we collected and analyzed industry job postings over a two-month period. However, because technical communication work has broadened significantly in its scope even in the few years since Lanier's study, we analyzed a much more extensive selection of job advertisements and a much more extensive range of competencies, products, technologies, and traits.

The Genre of the Job Advertisement

Job advertisements, as a genre, have the specific purpose of hiring an employee for a company or organization, so they typically include consistent kinds of descriptive information that can serve as a barometer of industry trends when studied over years and even decades. For instance, Lauer (2013, 2014) studied how specific technology-related keywords were used in twenty years of academic job advertisements. She was able to trace patterns in use that reflected the values and needs of technical communication and writing programs over that time.

As Lanier (2009) discusses, job advertisements are rich sources for analysis because they tend to include a range of detailed information that job seekers might need to determine whether they would like to apply for a job or if they have the right qualifications. In fact, Monster.com recommends that companies developing and posting ads "accurately set job seeker expectations and fully list all related job duties," because the greater detail a company can include in their ad, the more targeted their applicant pool will be. ("Tips for improving a Job Ad," http://monster-usen.custhelp.com/app/answers/detail/a_id/4819). This advice encourages companies to craft job ads to be as specific as possible and thus the ads provide researchers with insight into not only job titles and other general information, but also descriptive details about day-to-day responsibilities and expectations.

Job Site Selection

We initially considered collecting job advertisements from multiple sites (Monster.com, Indeed.com, and so forth), to obtain the largest possible data set. However, we ultimately limited the search to one site to reduce the likelihood of collecting duplicate job ads from companies advertising the same job on multiple sites. We utilized Monster.com for the job search because, as Lanier (2009) notes, it is widely used and robust, and, perhaps because of this, it returned more technical communication jobs in our initial searches than any of the other sites we examined.

Because STC hosts a job board, we considered collecting job postings from that site as well. For several reasons, however, we chose not to do so. First, we found that few of the jobs posted on the STC site were actually unique to that site; the majority appeared

to be mined from other job sites, which would have led to a potentially high number of duplicate postings. Additionally, because the STC site utilizes a different identification scheme/job ID number than jobs from Monster.com, it would have been difficult to identify and remove duplicates with any level of certainty. Finally, the search capabilities on the STC job board were far more limited than those on Monster.com.

Job Title Selection

To identify jobs that technical communication graduates and current workers would be qualified to apply for, we began generating a list of possible job titles by looking at the jobs posted on the STC job board. We added to that list by drawing on the job title data provided by the respondents to the survey reported in Blythe, Lauer, and Curran (2014). We then drew upon industry information presented at the STC pre-conference session at the 2013 Council for Programs in Scientific and Technical Communication (CPTSC) conference. Our final list of job titles was extensive, in and of itself supporting the notion that today's technical communicator is far more than a writer in a cubicle (see Table 1).

Table 1. Job titles (Search terms)

Content Administrator	Social Media Specialist
Content Analyst	Social Media Writer
Content Architect	Technical Editor
Content Coordinator	Technical Writer
Content Designer	UI Designer
Content Developer	UI Developer
Content Editor	UX Analyst
Content Manager	UX Architect
Content Producer	UX Consultant
Content Specialist	UX Designer
Content Strategist	UX Developer
Content Writer	UX Manager
Documentation Consultant	UX Researcher
Documentation Specialist	UX Specialist
Front End Designer	Web Content Administrator
Front End Developer	Web Content Analyst
Grant Writer	Web Content Architect
Information Architect	Web Content Coordinator
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Social Media Manager	

Data Collection

Utilizing the job titles as search terms, we collected job postings from Monster.com over a 60-day period from September to November of 2013, saving approximately 3,400 job advertisements. An initial examination of the job descriptions, required education, and desired skill set for these advertisements enabled us to cull duplicate postings as well as postings that were not related to technical communication. We also discarded jobs that were focused primarily on technical/tools work rather than rhetorical work, because it is the rhetorical work that is at the heart of technical communication. So, for example, if a posting indicated that the job responsibilities were almost exclusively coding, with little or no design, writing, or client-side communication, then we discarded the job. Additionally, we removed jobs requiring a high level of experience and skills with complex back-end object-oriented programming languages (for example, Java, PHP, C+, Perl), because most graduates of technical communication programs would not have these skills, nor are they at the center of technical communication work. However, we kept jobs that required client-side technical expertise in scripting languages (for example, HTML/CSS/Javascript), since these postings typically suggested that applicants would play a key role in the design of information for an audience.

We kept all jobs that emphasized rhetorically-informed writing, communication, and design skills, even if such jobs requested a familiarity with hard skills that were highly technical. Finally, we kept jobs that fell into a gray area, for which some graduates from technical writing programs may not be qualified, but graduates from certain programs (for instance, Michigan State University's Experience Architecture program), or graduates from a technical writing major with a technical cognate area or minor, could be qualified. Once the culling process was complete, we were left with approximately 1,500 job postings for review.

Our initial examination of the job postings revealed that the jobs fell into two main categories—information development and user experience—with divergent responsibilities, information products, and skill sets. We determined that 914 jobs were information

development positions, and it is these jobs on which we focus here. The user experience jobs will be discussed in a separate article.

Data Analysis

We first analyzed the job postings by mining them for position title, job type (full- or part-time, permanent, temporary/contract), required/preferred education level, required/preferred experience level, geographical location, salary, and industry sector. We then began the process of coding for professional competencies and personal characteristics. Competencies, sometimes referred to as "practical skills," (Henschel & Meloncon, 2014) are more concrete and easily-defined professional abilities, such as editing and project management. Personal characteristics are more abstract traits, such as critical thinking, creativity, and leadership. Henschel and Meloncon (2014) refer to these as "conceptual skills," and note that these are the "high-order knowledge and literacies a technical communicator needs to be successful and remain flexible in the ever-changing workplace" (p. 5). We prefer the term "personal characteristics" because it emphasizes that these traits can be both innate and learned.

We developed an extensive list of codes for competencies and personal characteristics based on the previous research discussed above. We also utilized the grounded-theory process of open coding (Holton, 2007), whereby we examined the job descriptions for core terms and concepts, and then categorized and labeled those to arrive at the codes. To ensure consistency in coding, we performed a two-phase measure of inter-rater reliability. In phase 1, each of the authors coded a set of ten job descriptions independently of one another; we then calculated the inter-rater reliability using Cohen's Kappa, which measures agreement adjusted for chance. Phase 1 resulted in a Kappa coefficient of k=.79, where .61-.80 is considered substantial agreement. We then discussed the codes on which we diverged, and independently coded a second set of ten descriptions. The Kappa coefficient for Phase 2 was k=.81, where .81-1.0 is considered almost perfect agreement. In both phases, the average percentage of agreement, without adjusting for chance, was 93%. Taken together, these measures indicate very strong inter-rater reliability for the coding process.

Once the codes were in place, we conducted a content analysis of the job descriptions (see Huckin, 2004) to code for information products (that is, the documents and other materials the employee would be expected to produce), tools and technologies, professional competencies, and personal characteristics. Our analysis resulted in an extensive and rich data set that will allow us, throughout the remainder of this article, to report on a wide range of intersecting characteristics and paint a more complete picture of what is expected of job applicants for various positions and experience levels.

Results

We begin our reporting of the study results with the general characteristics of the job advertisements, followed by the information products, tools and technologies, professional competencies, and personal characteristics called for by the postings.

Job Categories, Types, and Locations

The job postings exhibited enormous variety in position titles, substantially exceeding the list provided by Baehr (2015). To enable more meaningful analyses, we grouped the jobs into categories using the position titles, job descriptions, information products, and technology tools. Based on these characteristics, we identified five job categories: technical writer/editor, content developer/manager, social media writer, grant/proposal writer, and medical writer (see Figure 1).

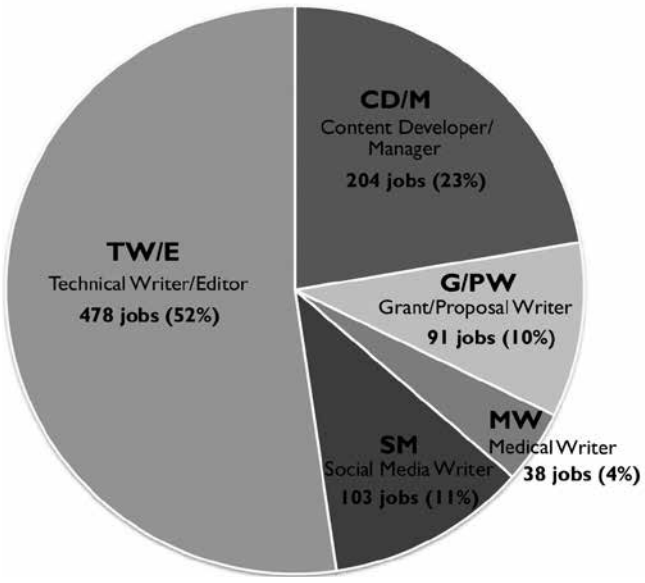

Figure 1. Job categories

Evolution of Technical Communication

As shown in Figure 1, just over half of the jobs (52%) were in the technical writer/editor category (TW/E); the second largest category was content developer/manager at 22%. Social media writers (SM) comprised 11% of the postings, grant/proposal writers (G/PW) 10%, and medical writers (MW) just 4%.

As Figure 2 illustrates, 69% of the jobs advertised were full-time permanent positions, while 28% were full-time temporary or contract jobs. Very few of the postings (3%) advertised part-time positions. There were proportionately more contract technical writer/editor jobs (41%) than in any other category; in contrast, the social media writer jobs were the least likely to be contract/temporary.

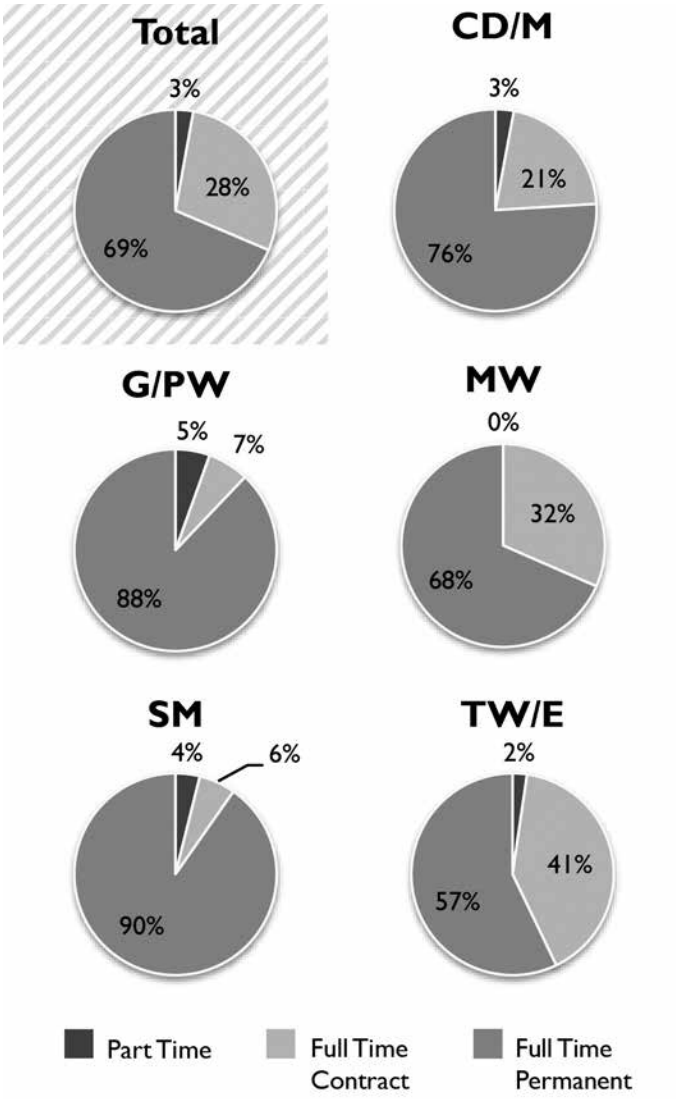

Figure 2. Job types

Figure 3 demonstrates the distribution of jobs across a range of industry sectors. For technical writer/editor jobs, the largest concentration (20%) was in the Information Technology Services/Software (IT) sector, followed by Professional/Business Services (13%) and Health/Bio/Pharmaceutical (12%). For content developer/managers, IT still had the largest group of jobs, but the Advertising/Marketing/Public Relations sector was also substantial, at 16%. For medical writers and social media writers, the Advertising/Marketing/Public Relations sector was even more substantial. Not surprisingly, medical writers were most heavily concentrated in the Health/Bio/Pharmaceutical industry (76%). For approximately 10% of the postings, it was impossible to determine the industry with any certainty; these were typically job postings from employment agencies that provided little information about the company.

The geographical data we collected align with the data from the 2013-2014 STC Salary Survey. As shown on the map in Figure 4, the jobs overall were concentrated most heavily in the South Atlantic census region (24%), followed by the Pacific (19%) and Mid-Atlantic (18%) regions. The top employers were California and Texas, at 15% and 8%, respectively, which corresponds to the numbers reported by the STC. Virginia ranked third in the STC report. In our study, New York held that position; however, New York had a disproportionately high number of social media jobs, which would not have been included in the STC data. Almost half (47%) of the Medical Writer positions in our study were in the Mid-Atlantic region (see Figure 4).

Fewer than 1% of the job postings we collected were for virtual/telecommuting positions, while a handful specified that the positions could be in one of several different locations.

The next section will report further demographic data, including education, experience, and salary. These data typically specify a minimum acceptable level and sometimes a preferred level above that. To present the data consistently, we report the minimum required experience and education levels. Because salary information was typically presented as a range, we averaged all the minimum salary figures together and all the maximum salary figures together and presented the data as a range for both hourly and annual positions.

	CD/M	G/PW	MW	SM	TW/E
Advertising/Market/PR	16%	4%	18%	25%	2%
Aerospace/Defense	0%	3%	0%	1%	6%
Automobile	1%	1%	0%	3%	1%
Communication	1%	0%	0%	3%	1%
Education	6%	9%	0%	4%	1%
Energy/Utility	1%	3%	0%	1%	2%
Engineering	1%	4%	0%	1%	6%
Finance/Banking	4%	8%	0%	3%	6%
Gov't/Military	1%	4%	0%	1%	5%
Health/Bio/Pharm	7%	11%	76%	5%	11%
IT Serv/Software	22%	9%	0%	7%	26%
Manufact/Construction	3%	3%	0%	4%	6%
Prof/Business Serv	9%	11%	3%	9%	18%
Retail/Consum Product	6%	7%	0%	15%	1%
Web/Internet	9%	2%	0%	3%	1%
Industry Unclear	10%	12%	3%	11%	7%

Figure 3. Industry by job category

Education, Experience, and Salary

As shown in Figure 5, the majority of job postings (57%) called for at least a bachelor's degree; however, almost a third of the postings (32%) did not specify a minimum education level at all. Medical writer positions were far more likely to require a graduate degree than any of the other job types (see Figure 5): 26% required a master's, and 5% required a doctorate.

Figure 6 shows the minimum experience levels required across all job types; these ranged from zero all the way up to ten years. Many postings (18%) did not specify an experience level or explicitly stated that it was "open." Based on the patterns in experience levels, we grouped the jobs into entry level (0-1 year, inclusive, of experience), mid-level (2-4 years of experience), senior level (5+ years of experience), and N/A categories to allow for more meaningful analyses.

Overall, the largest group of jobs was in the mid-level category. However, there are proportionately more entry-level Content Developer/Manager and Social Media Writer jobs than jobs in any other category.

Not surprisingly, lower education levels were more acceptable in jobs that required fewer years of experience. Among entry-level positions, 10% stipulated a high school diploma as the minimum education, and another 10% called for at least an associate's degree; for the senior-level positions, only 1% indicated that a high school diploma was sufficient, with just 4% accepting an Associate's. However, even among the senior-level positions, few jobs required a graduate degree, although more preferred one.

Although Monster.com specifically encourages employers to provide potential applicants with salary and compensation information ("Tips for improving a

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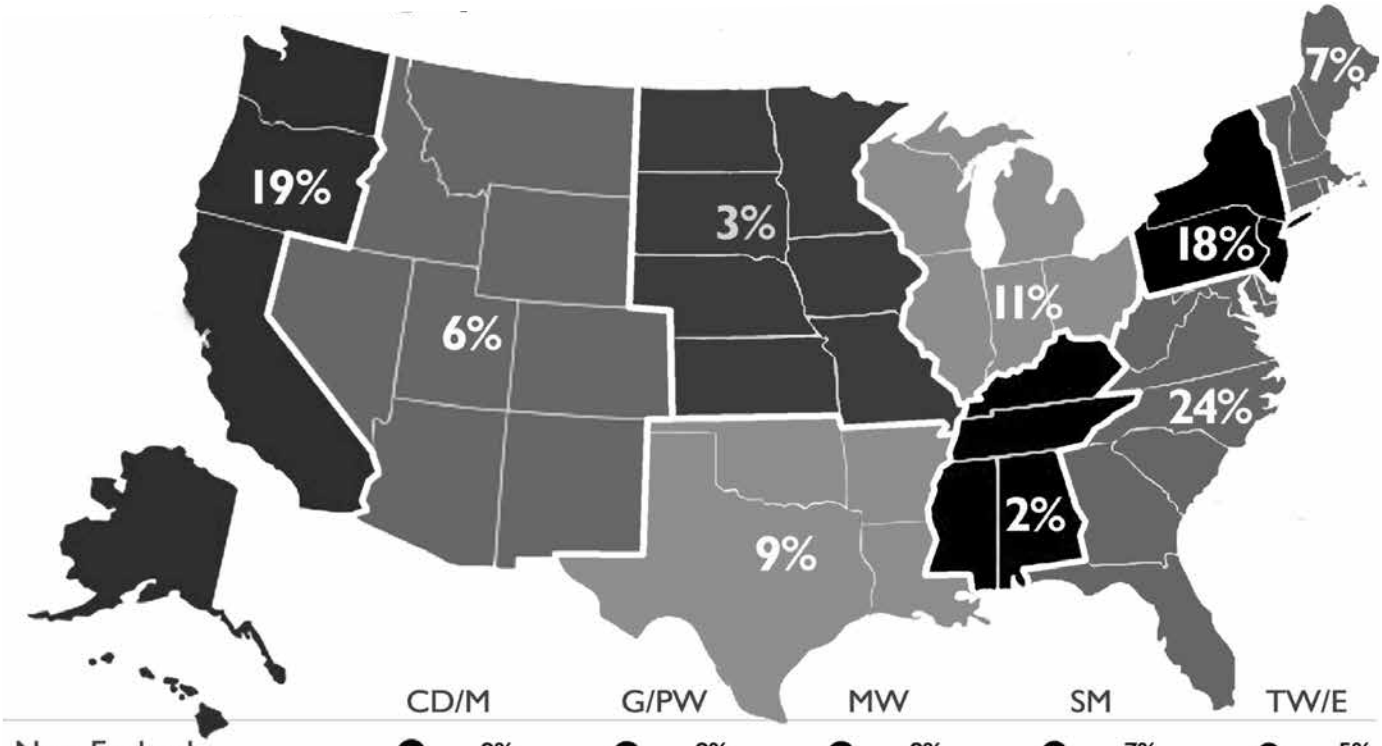

	CD/M	G/PW	MW	SM	TW/E
New England	9%	8%	8%	7%	5%
Mid-Atlantic	15%	24%	47%	24%	14%
East North Central	11%	10%	5%	13%	11%
West North Central	1%	1%	3%	1%	4%
South Atlantic	25%	25%	11%	19%	26%
East South Central	2%	2%	3%	3%	2%
West South Central	6%	11%	0%	6%	11%
Mountain	6%	9%	3%	5%	6%
Pacific	21%	9%	16%	22%	20%

Figure 4. Job locations

Job Ad"), only 16% of the job postings provided any sort of salary information beyond stating that pay was commensurate with experience; these were almost evenly divided between hourly and annual jobs. Again, salaries were often provided as ranges, or as minimum values, so we identified ranges for each job category by averaging the minimum values and the maximum values. As shown in Figure 7, hourly rates ranged, on average, from $21/hour to $37/hour; annual salaries averaged from approximately $49K to $78.5K. There was insufficient salary data to calculate a reliable average maximum salary for Medical Writer positions.

Beyond the general demographic information presented above, we engaged in more in-depth analysis of the job ad descriptions to illuminate the breadth of expertise required within the various position categories.

	CD/M	G/PW	MW	SM	TW/E
High School	4%	0%	0%	1%	6%
Associates	4%	1%	3%	3%	7%
Bachelor's	59%	77%	47%	70%	50%
Master's	0%	1%	26%	1%	1%
PhD	0%	0%	5%	0%	0%
Open	32%	21%	18%	24%	36%

Figure 5. Education by job category

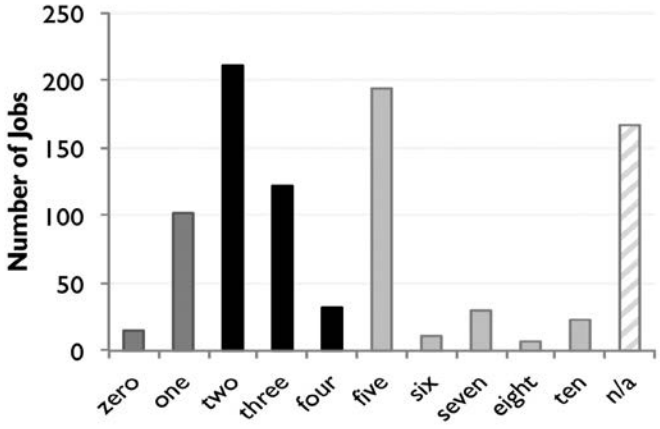

Figure 6. Experience levels

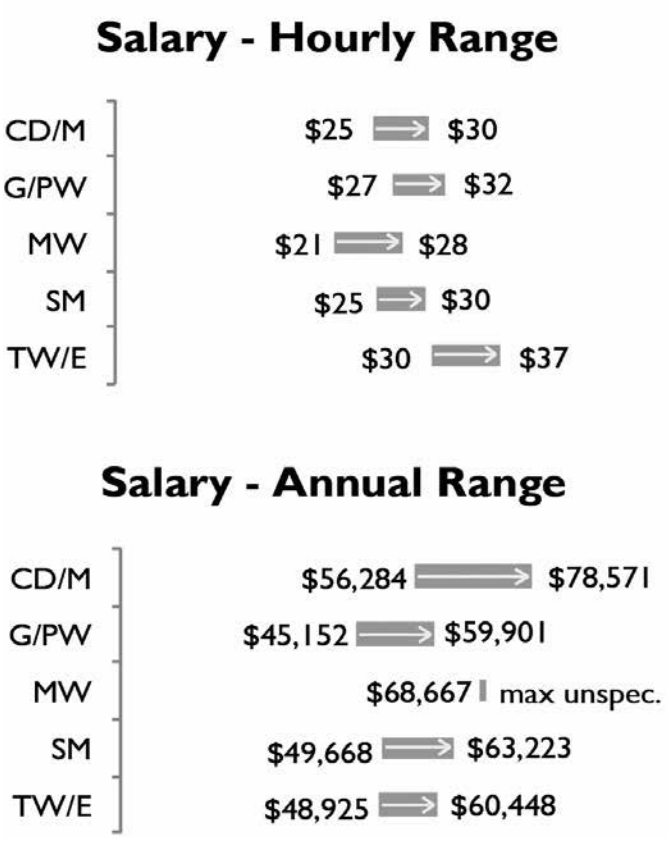

Figure 7. Salary by job category

We report our findings with regard to information products, tools and technologies, professional competencies, and personal characteristics in the sections that follow.

Information Products

Information products are the genres and content types that applicants will be expected to produce on the job. As Figure 8 shows, the job postings indicated a range of information products for which applicants would be responsible; these serve to differentiate the job categories from one another.

Certain products dominate for some job categories. For example, user guides/technical documents were by far the most visible product for the Technical Writer/Editor category, requested in 85% of those postings (we were unable to consistently determine from the job postings whether these were predominantly intended for print or for digital use). (This finding aligns with the survey results of alumni reported by Blythe, Lauer, and Curran (2014), as well as the managerial perceptions reported by Dubinsky (2015).)

Evolution of Technical Communication

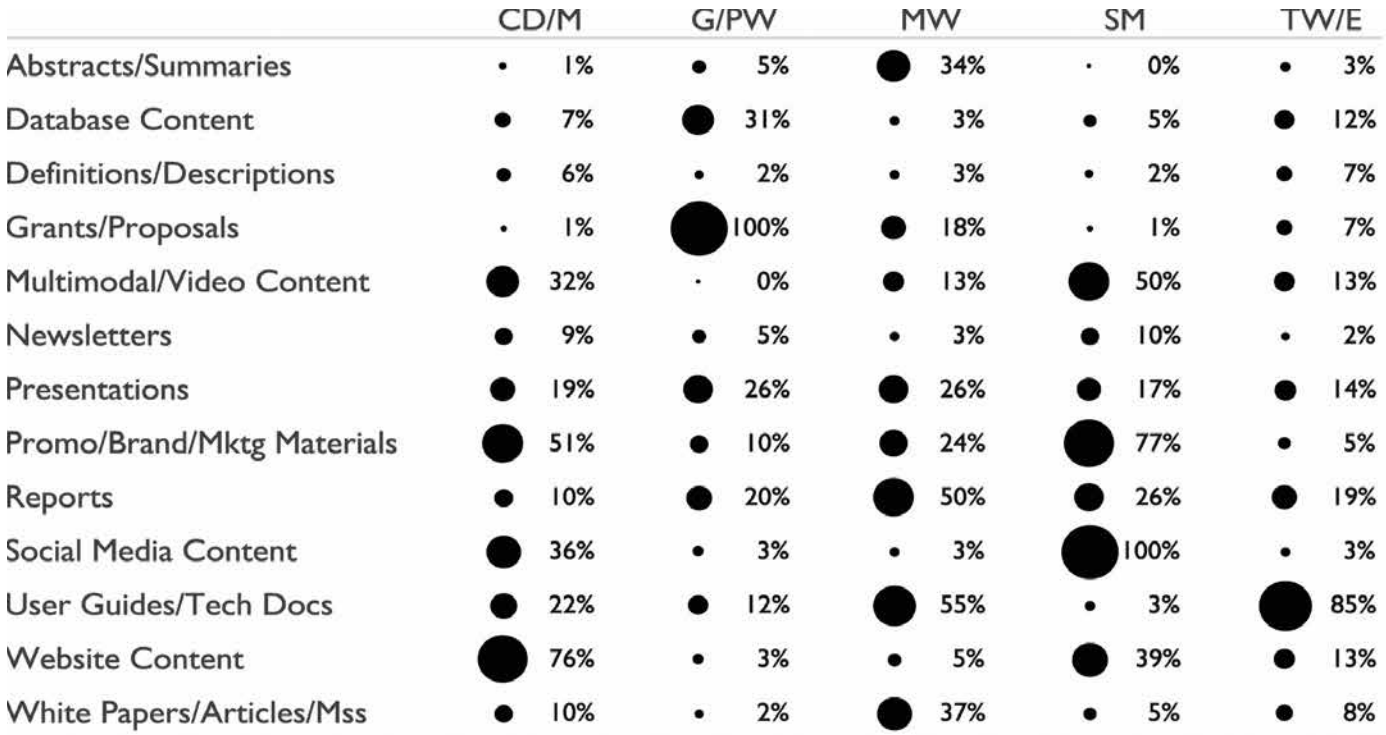

Figure 8. Information products by job category

Grants/proposals were, unsurprisingly, the dominant product for that job category, although database content was also called for in 31% of the jobs. For the other job categories, the important products are more distributed. For example, while all of the Social Media positions involved social media writing, promotional/brand/marketing materials were extremely important (77%), as was multimodal/video content (50%), and Web site content (39%). For Content Developer/Manager positions, Web site content was the central product (76%), but 51% of the jobs called for promotional/brand/marketing materials, 36% requested social media writing, and 32% asked for multimodal/video content. Likewise, although 55% of the Medical Writer jobs noted that applicants would be producing user guides/technical documents, 50% called for reports, 37% for white papers/articles/manuscripts, and 34% for abstracts/summaries.

Certain information products were important across multiple job categories (see Figure 8). For example, jobs in any of the categories may involve creating presentations, although they were called for in more Grant/Proposal Writer and Medical Writer job postings (26% of each) than in postings from other categories. Similarly, with the exception of Content Developer/Manager positions, reports were an important product across categories, particularly the Medical Writer category. Multimodal and video content were central to Social Media and Content Developer/Manager positions, but much less important in the other categories.

Similar to Lanier (2009), we found that genre knowledge—the ability to craft specific types of information products—is essential in the workplace. However, our data suggest that the PDF documentation—and possibly other hard-copy documentation—that was so highly ranked in Rainey's (2005) data from managers has largely fallen by the wayside to make room for more varied—and more nimble—forms of content. The information products we noted were more consistent with Blythe Lauer, and Curran (2014), which is to be expected, since their study was conducted more recently. Our data also reveal the diversification of information products and the importance of certain products to specific categories of jobs, particularly the emphasis on promotional and branding materials within Content Developer/Manager and Social Media positions.

	CD/M	G/PW	MW	SM	TW/E
MS Office	37%	66%	39%	25%	59%
Adobe CS/CC	10%	8%	3%	2%	5%
Acrobat	13%	12%	11%	2%	16%
Photoshop	25%	14%	5%	12%	12%
Illustrator	13%	11%	3%	6%	11%
InDesign	14%	13%	3%	3%	8%
Dreamweaver	14%	8%	3%	3%	6%
Framemaker	0%	0%	5%	0%	10%
HTML/CSS/Javascript	33%	0%	3%	12%	10%
XML	4%	0%	0%	0%	8%
Content Management Sys.	40%	0%	8%	17%	6%
DITA	0%	0%	0%	0%	4%
Adobe RoboHelp	0%	0%	3%	0%	6%
MadCap Flare	0%	0%	0%	0%	4%
MS SharePoint	7%	8%	0%	4%	11%
Visio	1%	5%	0%	1%	15%

Figure 9. Tools and technologies by job category

Tools and Technologies

The job postings reflected an extensive range of tools and technologies, and, as Figure 9 illustrates, these varied with job category.[1]

The one exception was MS Office, which was the most commonly requested software in every job category. Medical Writer jobs, beyond their reliance on MS Office, were much less technology-dependent than any of the other jobs. Social Media positions were also not particularly technology-oriented, although 17% of the positions called for skills with Content Management Systems (CMS). For the Grant/Proposal Writer positions, there was some call for skills with design and layout software. Content Developer/Manager jobs had a slightly greater emphasis on these tools, particularly on Adobe Photoshop, but more frequently, those jobs called for skill with HTML/CSS/Javascript/jQuery, and, of course, CMS. Finally, the Technical Writer/Editor positions called for the greatest variety of tools, but with less focus on any one particular tool or type of tool.

While the calls for particular tools typically did not vary with experience level, requests for both MS Sharepoint and MS Visio did increase markedly with experience level, most likely a reflection of increased managerial responsibilities. The dominance of MS Office that we observed is consistent with previous research. However, our data suggest that some facility with additional tools and technologies—particularly CMS, Web scripting technologies, and design and layout software—is also important.

Professional Competencies

We define professional competencies as workplace-related capabilities that are often taught explicitly in technical communication programs, but that are not explicitly tied to a technology and do not necessarily result directly in a product. Content management

1 Because Adobe CS is an inclusive package of software programs, when job advertisements called for proficiency in Adobe CS we also coded for Photoshop, Illustrator, Acrobat, and Dreamweaver.

	CD/M	G/PW	MW	SM	TW/E
Audience Awareness	37%	19%	13%	35%	29%
Business/Strategic Planning	18%	12%	0%	34%	3%
Comm-Client/Customer	24%	15%	29%	35%	13%
Comm-Oral/Verbal	32%	46%	37%	40%	35%
Comm-Written	74%	86%	87%	70%	75%
Comm-Unspecified	22%	14%	8%	19%	17%
Content Dev/Mgmt	72%	12%	13%	34%	15%
Editing	50%	51%	58%	25%	51%
Project Planning/Mgmt	55%	69%	58%	67%	49%
Research	28%	62%	50%	28%	40%
Style Guides/Standards	36%	23%	45%	15%	40%
Subject Matter Familiarity	31%	33%	76%	25%	45%
Transl. Complex Material	8%	12%	16%	5%	20%
Usability & Testing	29%	0%	0%	2%	22%
Visual Communication	44%	29%	50%	27%	49%
Web Analytics	41%	1%	0%	70%	3%
Website Design	25%	0%	0%	9%	4%
Work with SMEs	12%	35%	8%	4%	41%

Figure 10. Professional competencies by job category

appears in our data both as a technology (CMS) and as a competency. When a job description focused solely on the use of a content management system, we coded it as a technology. When a posting called for the conceptual and rhetorical work of producing and managing content, we coded it as a competency. A single job could be coded for both if both systems and conceptual work were discussed in the ad.

Professional competencies were another differentiating factor among job categories, although, as shown in Figure 10, the differences were more subtle. Almost all of the competencies appeared in every job category, but with different frequency.

Perhaps not surprisingly, written communication was the most frequently requested competency across categories, appearing in at least 70% of the postings in each category, and much more in the Grant/Proposal Writer and Medical Writer categories. Likewise, project management was extremely important in all categories, requested by approximately half the jobs or more in each category. Editing, although called for in only 25% of Social Media positions, was the third most requested competency across all categories. Beyond these competencies, the categories began to diverge more visibly. Visual communication, for example, is central to Content Developer/Manager (44%), Medical Writer (50%), and Technical Writer/Editor (49%) positions, but less so for Grant/Proposal Writer (29%) and Social Media (27%) positions. Similarly, research is vital to Grant/Proposal Writer (62%), Medical Writer (50%), and Technical Writer/Editor (40%) positions, but is much less important

for Content Developer/Manager and Social Media jobs (28% each). Subject matter familiarity is enormously important in Medical Writer positions (76%), and important to Technical Writer/Editor positions (45%), but figures less prominently in the other categories.

Not surprisingly, the average number of competencies within a posting increased with experience level; however, we discerned no other clear patterns between competencies and experience level.

Overall, written communication continues to dominate the technical communication landscape, but our data emphasize that several additional professional competencies are also essential, most notably project management, editing, visual communication, research, and, as Lanier (2009) noted, subject matter familiarity. Like our data on information products, the competencies data emphasize the centrality of certain abilities within specific job categories, such as a stronger emphasis on audience awareness and Web analytics in the Content Developer/Manager and Social Media positions, which aligns with their development of promotional/brand/marketing materials.

Personal Characteristics

Personal characteristics are more abstract than professional competencies, including abilities such as analytical/critical thinking, creativity, and so on. As shown in figure 11, overall, personal characteristics show more consistency across job categories than competencies do.

Collaboration and time management were the two most frequently requested personal characteristics across all categories, followed by independence/initiative and analytical/critical thinking. Requests for several of the personal characteristics in particular increased with experience level (see Figure 12).

Perhaps to be expected, jobs at higher experience levels were much more likely to call for leadership and interpersonal skills. Requests for analytical/critical thinking and problem solving abilities also increased sharply with experience level, as did requests for time management skills, and to a lesser extent, multi-tasking.

Our data suggest that the personal characteristics required of technical communicators have held relatively constant across studies. Certain abilities continue to be central, although it appears that some new skills—such as multitasking—have entered the mix.

	CD/M	G/PW	MW	SM	TW/E
Analytical/Critical Thinking	49%	55%	29%	46%	33%
Collaboration	69%	66%	66%	60%	47%
Creativity	26%	10%	13%	38%	7%
Detail Oriented	37%	51%	55%	23%	39%
Flexibility	17%	16%	5%	19%	16%
Independence/Initiative	32%	47%	50%	50%	40%
Interpersonal	25%	38%	39%	37%	25%
Leadership	25%	25%	29%	42%	19%
Learning	25%	13%	21%	35%	26%
Multitasking	33%	41%	29%	32%	27%
Organization	38%	49%	11%	29%	32%
Problem Solving	22%	24%	16%	21%	18%
Time Mgmt/Deadlines	51%	65%	61%	49%	46%

Figure 11. Personal characteristics by job category

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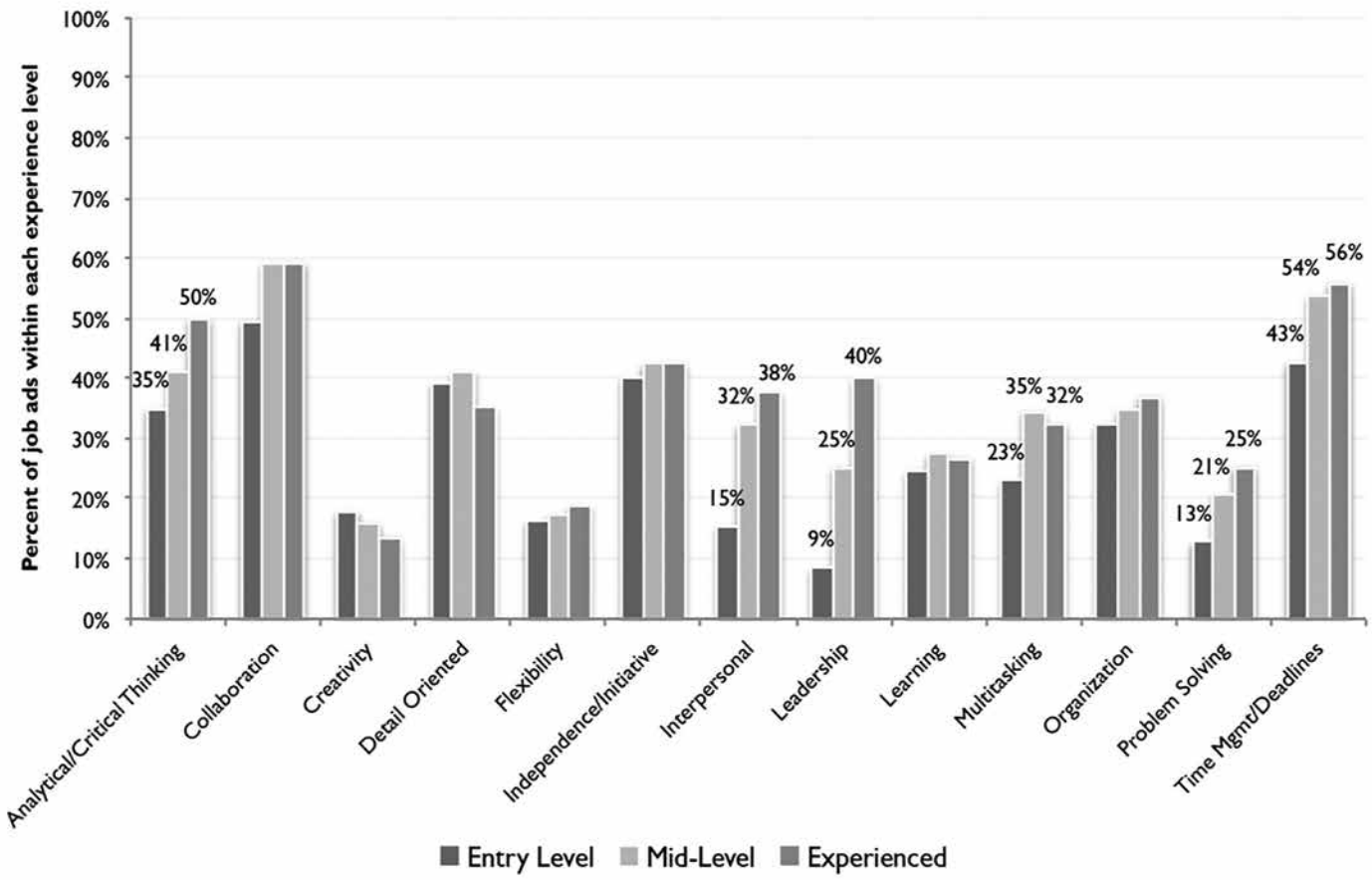

Figure 12. Personal characteristics by experience level

Summary

The data reported here help to modernize our understanding of the field of technical communication. Any one job advertisement cannot speak beyond that single job, but when over 900 advertisements are collected and analyzed for the wide range of characteristics they include, we can see patterns emerge in demographics, products, technologies, and competencies that can inform the knowledge and habits of both programs and practitioners. We will discuss the broader implications of these patterns in the section below.

Discussion

This study shows the breadth of competencies that are now demanded of technical communicators. It also reveals how the positions for which technical communicators are qualified reach beyond instruction and manual writing to encompass a wide range of audiences, content, contexts, and media.

New Positions, New Competencies

Jobs in the more familiar category of Technical Writer/Editor, as well as Grant/Proposal Writer and Medical Writer, comprised two-thirds of the job advertisements we analyzed. However, as Dicks (2009) noted, although technical communication work has remained constant for some in the field, "the nature of work for many technical communicators is changing so rapidly that many now perform an entire task set that they did not even know about five years ago" (p. 51). A full third of the postings we analyzed were for jobs in the newer categories of Content Developer/Manager and Social Media Writer. These jobs were much less (or not at all) visible prior to the wave of mobile and social media development that began in 2007 with the release of the iPhone.

Our data do not entirely support claims that technical communication has undergone a sea change from a document-based model of content development to a topic-based model in which "content is freed

from the confines of static documents" (Andersen, 2014, p. 116). The data do, however, support the idea that content—as opposed to documents—drives the newer types of technical communication positions. These positions are also much more likely to require capabilities with Web analytics, Web and social media content, multimodal/video content, and promotional/brand/marketing materials, indicating that employers are beginning to consider content as a tool for building relationships with their customers (Andersen, 2014) and reflecting their brand.

This emphasis on content necessitates a re-examination of academic curricula. Most programs do not require a content management course, nor do they require a course on social media (Meloncon & Henschel, 2013), although these topics may be integrated into other courses. Programs are more likely to require a "Web" course (45%) or to have a "Web" elective (55%), but as Meloncon & Henschel note, such a course is approached many different ways and may not always provide students with a foundation in both the conceptual and applied understanding of Web content authoring, as well as the supporting technology skills they are likely to need in the workplace. For example, Web analytics (including SEO) is a competency that is requested in 70% of Social Media Writer jobs and 41% of Content Developer/Manager jobs, yet it is unclear whether students receive any instruction in Web analytics because analytics are not typically considered "authoring" skills.

Content factors prominently in decisions about information products/genres as well. Programs address a range of information products in their curricula, but promotional/brand/marketing materials are unlikely to receive attention because we have historically considered them to be the purview of marketing and PR programs. Yet, in our analysis of job advertisements, we repeatedly saw employers asking for the ability to represent their brands in a wide range of content—content for which the employee would have full responsibility (including not just marketing and promotional material, but social media interactions as well). An increasing amount of content is being produced in real time, without the luxury of extensive oversight or quality control. Thus, content developers' awareness of how content reflects a brand at all levels is imperative to the material they produce and, in turn, to shaping the overall experience a user has with an organization. This factor strongly suggests that technical communication programs need to help students develop an ever more complex understanding of audience that incorporates awareness of how brand is communicated across content types, styles, and products.

Hybridizations between audience/brand and between technical communication/marketing are already visible in the work of practitioners. For instance, the STC offered a Webinar, based on a progression presented at the 2012 Summit, called "It's All Marcomm: A Tech Writer Goes Fluffy" in which Joe Staples, a technical writer, discusses how his skills have had to expand from producing primarily documentation, guides, and manuals to producing "marcomm" (marketing communications) that includes content like Web and email copy, briefs, white papers, and scripts (Staples, 2012).

In short, our data suggest that there may be substantial curricular work to be done for programs to adequately prepare graduates for new types of technical communication positions.

Shared Competencies

The data demonstrate that several competencies are central to both newer and more traditional types of technical communication positions. These competencies are not new to the field, but some continue to grow in importance. Written communication remains at the top of the list of competencies across all job categories; likewise, editing remains central to technical communication work. Neither is a surprise; at the core, most technical communicators are still writers and editors, even when they are writing and editing new forms of content. Writing and editing are also at the heart of academic programs. However, the data emphasize that technical communicators must also be project planners and visual communicators who have subject matter familiarity.

Project management is crucial to success in today's technical communication workplace. Yet, only 12% of technical communication programs require a project management course, while just 6% offer it as an elective (Meloncon & Henschel, 2013). Of course, some level of project management is addressed informally within other courses, particularly when instructors assign larger projects that involve collaboration and multiple deliverables. However, given the extent to which project management is articulated in job postings, it would be

in the best interest of graduates if programs foreground this competency as a curricular objective, teaching it directly and explicitly, whether through dedicated courses or not.

Unlike project management, visual communication now has a central place in technical communication program objectives. Meloncon & Henschel's (2013) data show that the percentage of programs requiring a document/information design course went from 4% to 40% between 2005 and 2011; this aligns with the 43% of job postings that call for visual communication abilities. While programs have made significant strides in incorporating visual communication competencies into curricula, a related product—video—is less commonly taught. A video course is required in only a small fraction (6%) of programs and is offered as an elective in only 12% (Meloncon & Henschel, 2013). It is possible that video analysis and production is incorporated into existing coursework, though this would be more difficult because of the extended time to attend to the complex interaction of modes (still and moving images, sound, text) that video requires. And yet, attention to video/multimodal content is important, because facility with such content is requested in 50% of social media writer jobs and 32% of content developer/manager jobs, and will arguably become more central to technical communication work as video instructions come to complement and, in some instances replace, print and Web-based instructions. Morain and Swarts (2012) argue that "user-generated tutorial videos are quickly emerging as a new form of technical communication" (p. 1), and the complexity of this kind of work is revealed in the six-page rubric they developed for instructors to use to assess instructional videos.

A final important competency merits mention here: subject matter expertise/familiarity, which is substantial across job categories, but even more significant in the MW and TW/E categories, and in jobs at higher experience levels. This is a particularly difficult competency to develop—it cannot be learned through workshops, it cannot be taught within the home departments of technical communication curricula, and it requires a particular mindset: a willingness to learn (called for in many job postings); but more, to learn material that may be outside one's comfort zone. Over half (58%) of academic programs require students to take courses outside the home department (Meloncon & Henschel 2013), but, as Meloncon and Henschel note, we don't have data that tell us what those courses are. Students could be (and many are) completing cognates in English literature when they need to be building their knowledge of engineering, or information technology, or applied biology. Another way for students to develop subject matter familiarity is through internships. The experience levels observed in the jobs data suggest that internships may also be essential in helping students enter a competitive workplace. Again, however, only about half of academic programs require an internship, and those internships vary widely in the degree of technical work involved. Requiring cognates and internships that are well-matched to both student interests and career demands will contribute greatly to graduates' ethos and credibility when they claim they can work with subject matter experts or explain technical material for lay audiences.

Tools and Technologies

Given the range of competencies reflected in the job postings, we expected to see extensive reliance on certain tools and technologies. Although the postings do reflect some level of reliance on multiple technologies, they also illustrate the extent to which MS Office still dominates in relation to other tools. Particularly within the TW/E jobs, we expected greater emphasis on powerful page layout and design tools, since these allow for more sophisticated and complex work in both visual and verbal communication. Adobe Creative Suite/Cloud, or a subset of its component programs, was present to varying degrees across job categories, but less than expected; Adobe's Technical Communication Suite was even less visible. The takeaway here may be that the willingness and ability to learn—again, frequently mentioned in the job postings as a desired characteristic—trumps expertise with a specific toolset. However, applicants who demonstrate both will be the most marketable.

The tools and technologies data raise the perennial question of how technical communication programs can best address the technology requirements of the workplace. Currently, only about one-quarter of technical communication programs require a course whose primary focus is tools, while one-quarter offer a tools elective (Meloncon & Henschel, 2013). More commonly, tools are taught within the context of other courses. In either case, students need to graduate with a conceptual understanding of different types of

technologies; skills with a subset of tools that should certainly include MS Office (not only MS Word), and should probably also include Adobe Creative Suite; a deserved sense of self-confidence in their abilities with technologies; and the willingness and initiative to learn new tools independently on the job.

To Specialize or Not

Although the job postings suggest that there remain shared competencies, characteristics, and tools at the core of technical communication, the introduction of new types of jobs, as well as the sheer breadth of information products and professional competencies across job categories, points to a potential dilemma for practitioners and programs: whether to specialize in a particular area within technical communication, or to develop a breadth of knowledge and skills that is even wider than in the past. Baehr (2015) noted that this was a point on which managerial perceptions varied; some participants felt that a broad skillset would "permit technical communicators to be more agile, adaptable, and flexible in their roles and to add greater value to organizations," while others believed that specialization was "inevitable" (p. 116). Baehr concluded that the best course of action would be to develop multiple specializations, which would "enable technical communicators to define their own roles, to a certain extent" (p. 116). Our data suggest that there are several points of overlap in products and competencies, which could allow some degree of movement among job categories—or multiple specializations—if one maintains a broad skillset and flexible outlook.

For programs, the question of specialization might be addressed through careful advising or, more formally, through the addition of concentrations or tracks that enable students to develop deeper knowledge in a particular aspect of technical communication.

Articulating Qualifications to Employers

Many of the patterns revealed by the job postings should encourage technical communicators to think carefully about the ways they articulate their qualifications to employers. This is crucial for seasoned practitioners and new graduates alike. For instance, one-third of the job postings leave education open; they do not require a college degree. This means that the burden is on applicants to make a compelling case for the value of their degree—emphasizing relevant coursework, assignments, and experiences that a non-degree applicant would not have had access to. And although many jobs *prefer* graduate degrees, only 2% of all jobs *require* them, so making the case for what knowledge and experience a graduate degree adds to a technical communicator's resume (especially in areas such as analytical/critical thinking, problem solving, leadership, and research) is especially important for those applicants.

Equally important is applicants' need to confidently and knowledgably negotiate their salary during the hiring process. Because so few jobs indicate a salary range, it may be difficult for applicants to determine where they might fit in a company's salary scale, even with resources like the STC Salary Database. Recent graduates, who are already generally short on confidence and experience, are in a particularly difficult position. Negotiating poorly at the entry level can have exponentially negative consequences on one's salary trajectory. Additionally, women and minorities, who are already well documented as earning less in the workplace, are especially susceptible to accepting a lower salary if they are not aware of the ranges that exist or lack confidence in their ability to negotiate. It is thus vital for applicants to cast a wide net for the most current salary data available.

Finally, faced with new job types, new products, and an ever-growing set of competencies, technical communicators need to consider more carefully than ever before how they will craft applications to best demonstrate the currency and relevancy of their abilities.

Conclusion

The study reported here has important implications for both practitioners and academic programs. One question that cannot be answered by our study is how closely the day-to-day tasks and responsibilities of technical communicators align with those described in the job postings. The postings may have been written by those within a technical communication department or project team—individuals who would work closely with or supervise the applicant and would thus be intimately familiar with the requirements of the job. However, the ads could also have been written by personnel who are not directly involved with the position (headhunters, HR representatives, and so forth). This is a limitation of our data set that we will be addressing in phase two of our study, during which we will be conducting site visits

and interviews with employees that represent each of the different job categories we've discussed in this study.

The limitation above notwithstanding, our study provides data that are valuable for both practitioners and academic programs, particularly as we consider the impacts of new types of technical communication work. For practitioners, the study offers a detailed and up-to-date understanding of the technical communication jobs landscape and the professional competencies, personal characteristics, information products, and technologies that are most sought after by hiring managers. Perhaps as importantly, the data offer practitioners ways of thinking about and framing their work to further their careers.

The study also provides valuable workplace data for those in academia who are engaged with ongoing efforts to keep curricula current and relevant, as well as those who work closely with students preparing to graduate and enter the workforce. The data point to potential disconnects between what is required of students in the classroom and what will be expected of them in the workplace. This in turn suggests that programs may want to consider updating or expanding their curricular requirements and core offerings to keep pace with the expansion of technical communicator roles in the workplace. Beyond supporting curricular revision, familiarity with what employers are looking for enables programs to help students craft stronger portfolios and better articulate their qualifications in a competitive market.

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Visualizing a Non-Pandemic: Considerations for Communicating Public Health Risks in Intercultural Contexts

By Candice A. Welhausen

Abstract

Purpose: Report the results of a rhetorical analysis that examines the ways that data visualizations of epidemic disease influence risk perception in global contexts, propose strategies that technical communicators can draw from when constructing data visualizations for intercultural audiences in crisis and emergency risk scenarios, and discuss implications for technical communication practice.

Method: Rhetorical analysis of four select infographics created by the New York Times to communicate Ebola risk during the outbreak that began in West Africa in 2014 using the following facets associated with design in global contexts: use of warm and cool colors, high versus low-context, and collectivism versus individualism.

Results: Data visualizations dramatically shape how risks are perceived. Language-based content may communicate one message about risk, while the visual strategies used in data visualizations may communicate a very different message. Rather than emphasizing control over the outbreak, I argue that the visual message in the infographics in this analysis communicates the opposite. Maps show Ebola breaching national (Figures 1 and 4) and international borders (Figure 2), and line graphs (Figure 3) show sharp increases in cases and deaths in Liberia and Sierra Leone.

Conclusion: Warm colors increase risk perception. Further, data visualizations are high-context, collectivistic forms of visual communication, which lessen risk perception among experts but intensify risk perception among nonexperts. Technical communicators can draw from the following guidelines when constructing data visualizations that communicate risk for intercultural audiences: show quantitative information using a variety of visualization strategies, include explanatory text and/or visuals to more fully contextualize data visualizations, and add comparative data visualizations.

Keywords: data visualization, risk communication, intercultural, public health, epidemic

Practitioner's Take-Away

- An awareness of how different approaches to data visualization and design can affect the ways in which audiences perceive risk, particularly in health and medical contexts
- An understanding of how cultural communication factors can affect how different audiences perceive and respond to aspects of risk
- Strategies for creating data visualizations that effectively convey information about risk—particularly risk associated with health and medical situations—in global contexts

Candice A. Welhausen

Introduction

In the twenty-first century, public health efforts to control crisis and emergency risk situations like the spread of infectious diseases are increasingly enacted at the international level. Technical communicators are often uniquely positioned to construct risk communication (Grabill & Simmons, 1998); however, such communication scenarios often pose significant intercultural communication challenges.

A common strategy for disseminating risk information is creating data visualizations like maps, bar charts, and line graphs. Yet while research has explored the effectiveness of these graphics in conveying risk to nonexperts (Ancker et al., 2006; Lipkus & Hollands, 1999), less attention has focused on how these visuals shape risk perception, particularly in crisis and emergency risk communication scenarios, which frequently involve culturally divergent audiences.

This article reports the results of a rhetorical analysis that examines the ways that data visualizations of epidemic disease influence risk perception in global contexts. Following these results, I propose strategies that technical communicators can draw from when constructing data visualizations for intercultural audiences in crisis and emergency risk scenarios, and discuss implications for technical communication practice.

Risk Communication In Global Contexts: An Overview

Technical communicators are often tasked with creating risk communication, which "informs individuals about the existence, nature, form, severity or acceptability of risks" (Plough & Krimsky, 1987, p. 6). Risk is "the probability of harm in any given situation," (Powell & Leiss, 2004, p. 33), and producing risk communication was historically envisioned as subject matter experts "transfer[ring]" information about risks to nonexperts (Plough & Krimsky, 1987, p. 8). However, experts tend to assess risk quantitatively (Short, 1984), that is, in terms of numeric values and mathematical probabilities, while nonexperts gauge how a particular hazard might affect them and their loved ones personally. Thus nonexperts perceive situations that are potentially deadly or likely to affect people in the future (Slovic, 1986) as well as public health threats that they have limited control over (Foege, 1991) as far riskier than experts.

Risk communication practice began to recognize these key perceptual differences in the 1990s with the emergence of social constructivist theory (Fischoff, 1995; Leiss, 1996; Powell & Leiss, 2004) by emphasizing the influence of "social context and culture" (Lundgren & McMakin, 2013, p. 17), which pushed back against the notion that effective risk communication should seek to align nonexperts' perception with expert opinion. In the field of technical communication, for instance, Grabill and Simmons' (1998) "critical rhetoric of risk" prompts practitioners to take culture, values, and interests into account when constructing risk communication.

At the same time, the notion of *culture* is an exceedingly broad and multifaceted concept as Aldoory's (2009) extensive review of risk perception research within the U.S. illustrates, while Kostelnick (1995) calls attention to the difficulty of constructing visual information for culturally heterogeneous readers. Although Kostelnick (1995) does not focus on risk communication, he argues that approaches toward intercultural visual communication often range from "universal" to "culture-focused" with shortcomings inherent to both theoretical positions. Thus, as this research demonstrates, constructing visual risk information for intercultural audiences can pose significant challenges for technical communicators.

Communication challenges can become even more pronounced in crisis and emergency risk scenarios like outbreaks of epidemic disease (see Covello et al., 2001) as demonstrated by the public reaction in the U.S. and Europe to the Ebola outbreak that began in West Africa in 2014 (see Higgins, 2014). Although the probability that the epidemic would spread to these countries was very low for a number of reasons, nonexpert, Western audiences still perceived a high level of risk because they had no control over how the disease was spreading. As news reports publicized the worsening situation, international public response quickly grew into an "epidemic of fear" (see Strong, 1990) that the outbreak would escalate into a global pandemic.

Methods: Rhetorical Analysis Approach

In this article, I examine the following research question:

> *How do mass-media data visualizations for communicating crisis and emergency risk information influence perception of risk in global contexts?*

Visualizing a Non-Pandemic

In addressing this question, I selected four static infographics (labeled Figures 1-4 in Table 1), which include two maps (Figures 1 and 2), one line graph (Figure 3), and a time line (Figure 4) that I analyze in detail.

All of the figures I analyzed were published in the *New York Times* (*NYT*) and used by that publication to communicate Ebola risk during the outbreak that began in West Africa in 2014. [The *NYT* created these figures based upon data from the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), Médecins Sans Frontières/Doctors Without Borders (MSF), and other organizations.] The *NYT* published these figures online in the article "How Many Patients Have Been Treated Outside of Africa?" (Ashkenas et al., 2015), and this entry appeared in the World, Africa section of the *NYT*. Due to reproduction limitations, I was unable to include copies of these figures in this article; however, each figure is described in detail in Table 1 and at the beginning of the article's "Results" section in the sub-section entitled 'Use of Warm and Cool Colors.'

Table 1. Description of figures

List of Figures	Genre	Description	Data Source(s) and Date
Figure 1	Map	Shows Ebola cases in the three affected West African countries: Guinea, Sierra Leone, Liberia. Uses shades of brown/beige and red to show increasing number of cases. Includes a scale in the top right-hand corner that displays number of cases in the following increments: 1-5 (light brown/beige), 5-20 (slightly darker brown/beige), 20-100 (darkest representation of brown/beige), 100-500 (bright red), and 500+ (dark red).	WHO Data as of November 5, 2014
Figure 2	Map	Shows the 24 individual cases of Ebola diagnosed outside of West Africa in the U.S. and Europe. Includes Europe, the Middle East, almost the entire continent of North America, the very top portion of South America, a portion of Asia and the top two-thirds of Africa. Labels cities in these countries where individual cases have been diagnosed using small colored boxes. Color of boxes indicates the vital status of each patient: recovered (green), in treatment (yellow) and dead (red).	CDC MSF WHO Other organizations Data as of January 5, 2015
Figure 3	Line graph	Shows the number of cases and deaths in the three affected West African countries for the time period 3/ 21/2014-2/17/15. Uses a series of three side-by-side line graphs. Line showing cases is light gray; line showing deaths is bright red. y axis is labeled 2,200; 4,400; 6,600; 8,800, and 11,000; x axis is labeled with the time period (3/21/2014-2/17/15) in each graphic. Exact numbers for cases and deaths are given at the end of each ascending line and labeled with a colored dot (gray and red, respectively).	WHO 3/21/2014—2/17/2015
Figure 4	Timeline	Shows a timeline of the five Ebola outbreaks that have occurred in Africa: 1976, 1995, 2000, 2007, 2014. Cases and deaths are shown using orange circles. Cases are shown in light orange; deaths are shown using a darker orange. Each outbreak is labeled by "worse year": 1976 is labeled 2nd worst, 1995 outbreak is labeled 5th worse, and 2014 outbreak is labeled 1st. Countries where outbreak occurred are listed under the label. A small map of Africa in light gray shadowing under each outbreak on the timeline shows affected countries in dark orange. Exact numbers of cases and death appear under each small map.	WHO Data as of November 5, 2014

Media coverage often plays a key role in communicating risk about emergent public health threats (Reynolds & Seeger, 2005), shaping the ways in which risks are perceived (Slovic, 1986). In the twenty-first century, online news outlets like the *NYT* have an inherently global reach, and visual risk information about epidemic disease outbreaks reaches an international audience through such venues. Indeed, with a subscription base of over 400,000 readers around the globe (*NYT* International Media Kit, 2014), the *NYT* is one of the most widely read newspapers in the world and is thus an effective selection to review in order to begin understanding aspects of communicating risk in international contexts.

In conducting the rhetorical analysis presented in this article, I applied three facets associated with design in global contexts:

- The use of warm colors (that is, red, orange, and yellow) and cool colors (that is, blue, green, and purple)
- High versus low-context (that is, how much information is presented explicitly versus how much information is implied based on context)
- Collectivism versus individualism (that is, if information focuses on the group as a whole or on the individual within the group)

In analyzing the figures from the *NYT*, I used these categories to assess the perspective of both nonexpert viewers (that is, readers with very little to no knowledge about Ebola) and expert viewers (that is, public health researchers). In so doing, I also emphasized Western (that is, predominantly European and North American) and non-Western (that is, areas other than Europe and North America) cultural considerations. The next section of this entry presents the results of this analysis followed by a discussion of the implications my findings have for technical communicators who are tasked with conveying information about risk to global audiences. In this discussion, I also propose guidelines or strategies technical communicators can use when constructing data visualizations that convey risk to audiences from other cultures.

Results

This section is organized into the three factors of visual intercultural communication identified in the "Methods" section of this article. In this section, I first provide a more in-depth overview of the four different infographics I analyzed for this project (as listed in Table 1) in order to provide readers with a better idea of the various design aspects of each. Such an overview can help readers better conceptualize both an overall infographic and the different design aspects of that infographic as I discuss the results of my review of each of them.

A Description of the Infographics Analyzed for This Study

Here, I provide a more comprehensive description of the kinds of infographics (4 total) I analyzed for this study. To begin, the infographic I refer to as "Figure 1" in Table 1 is a map that uses shades of brown/beige and red to show increasing number of cases. This map includes Guinea, Sierra Leone, and Liberia—the three West African countries affected by the Ebola outbreak. This map includes a scale in the top right-hand corner that displays the number of cases that occurred in each nation in the following increments/colors: 1-5 cases (light brown/beige), 5-20 cases (slightly darker brown/beige), 20-100 cases (darkest representation of brown/beige), 100-500 cases (bright red), and 500+ cases (dark red). On this map, the darkest areas of red shading are clustered in Sierra Leone, southern Guinea, and northern Liberia—thus indicating the highest numbers of cases occurring in those areas—while the lightest areas are north and northwest Guinea and southern Liberia, indicating the fewer number of cases there.

The infographic I refer to as "Figure 2" in Table 1 is a map that that shows Ebola cases diagnosed outside of West Africa. This map includes Europe, the Middle East, almost the entire continent of North America, the very top portion of South America, the western portion of Russia, and the top two-thirds of Africa. The map also contains the names of cities in which individual cases of Ebola were diagnosed, and a series of small, colored boxes—ranging in color from green to yellow to red—appears after the name of each city. In this example, the color of the boxes indicates the vital status of each patient. The system is as follows:

- Recovered (green)
- In treatment (yellow)
- Deceased (red)

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Additionally, on the same map, the three West African countries in which the Ebola outbreak occurred (that is, Guinea, Sierra Leone, and Liberia) are shaded in light yellow to indicate "countries with Ebola outbreaks." The map is also annotated with descriptive information about Ebola patients who were diagnosed in New York (for example, a doctor who had been treating patients in Africa), Madrid (for example, a nurse who had been treating a missionary there), and Dallas (for example, two nurses who had been treating an Ebola patient there).

The infographic identified as "Figure 3" (a series of different line graphs showing the increase of cases in each country affected—Guinea, Sierra Leone, and Liberia—over time) in Table 1 also relies heavily on color to convey information about risk. This graphic uses different colored lines to depict the number of cases and deaths in the three affected West African countries for the time period March 21, 2014 to Feb. 17, 2015. This graphic does so through a series of three line graphs that appear side-by-side in the same overall image, and each of the three individual graphs depicts increases in rates of infection in one of the affected nations. (There is one graph for Guinea, one for Sierra Leone, and one for Liberia.) Each of the individual graphs uses two different colored lines to convey specific information. All three line graphs use a gray line to represent the rates of infection in each nation over time and a red line to note the deaths that occurred in each nation over time. In each of the three line graphs, the y axis notes the number of persons affected by the disease (with specific numbers indicating the rates of 2,200; 4,400; 6,600; and 11,000) and the x axis notes different points in time between March 21, 2014 to Feb. 17, 2015. The right-most/ending point of both the gray lines (infected individuals) and red lines (deceased individuals) on all three line graphs ends with a dot (gray or red depending on the color of the related line) and the specific number of cases of infection diagnosed and of deaths from the disease in each nation as of Feb. 17, 2015.

Finally, the last infographic (labeled as "Figure 4" in Table 1) shows a timeline superimposed above a set of maps of Africa. In this visual, dots are used to indicate when/the year in which a major outbreak of Ebola occurred in Africa (as well as note the number of affected individuals per outbreak based on the size of the related dot). Below each of these dots is a map of Africa in which only the related affected nation is highlighted (in dark orange) while the rest of the continent is depicted in gray. Key points on the timeline part of the infographic are the first Ebola outbreak that occurred in Africa in 1976, followed by dots noting outbreaks in 1995, 2000, 2007, and concluding with the most recent outbreak that began in 2014. On the timeline part of the visual, cases and deaths are depicted by the use of orange circles with light orange circles indicating cases of infection and dark orange circles indicating deaths from the disease. (In each case, the smaller, darker orange circle indicating deaths appears in the middle of a larger, lighter orange circle that notes number of infections.)

Additionally, the dots noting each outbreak are labeled by "worse year." For instance, the outbreak in 1976 was the 2nd worst, the 1995 outbreak was the 5th worse, and the outbreak that began in 2014 was the 1st. The country(ies) where the outbreak occurred are listed under this label, and as noted earlier, a small map of Africa appears under each listing of countries—the map being completely gray except for those countries listed as having outbreaks appearing in orange on the related map. Finally, under each map of Africa that notes where an outbreak occurred in a given year, the related number of cases of infection and Ebola-related deaths for that year are listed.

Now that I've explained these items in more detail, I wish to discuss my analysis of these four infographics in terms of three areas associated with culture and visual design—those areas being the following:

- Use of warm and cool colors
- Aspects of high versus low-context cultures
- Factors of individualistic versus collectivistic cultures

Through such an approach, I highlight how factors of culture and design can affect perceptions of risk in global contexts.

Use of warm and cool colors

The notion that color is often interpreted in culturally-specific ways has long been recognized in intercultural communication theory. Madden et al.'s (2000) investigation into consumers' color preferences in eight different countries (Austria, Brazil, Canada, Columbia, Hong Kong, China, United States, and Taiwan) reveals cross-cultural consistencies in the ways that warm and cool colors are perceived. They found that cool colors—"blue, green, and white are strongly associated

with 'peaceful,' 'gentle,' and 'calming'" (p. 97), while warm colors such as red were routinely interpreted as "active," "hot," "vibrant," "emotional," and "sharp" (p. 98). Somewhat more variation was found for the tones identified as warm (for example, gold, orange, and yellow), but the authors report that meanings for these colors also tended to cluster near the "active," "hot," "vibrant," "emotional" end of their analysis scale.

The item to consider here is that color is often thought to elicit an emotional response (Amare & Manning, 2013). Thus the implications of Madden et al.'s (2000) research suggests that warm and cool color choices can dramatically shape risk perception in visual representations like data visualizations. This is because viewers will often attribute these associations to the risk being depicted in an image. Data visualizations, in turn, frequently use color to differentiate among variables within the context of the same visual. Consequently, analyzing the warm and cool color choices of the *NYT* infographics I examined in this analysis provides an initial framework for informing how technical communicators might think of and use aspects of color when creating visuals depicting aspects of risk to international audiences. Indeed, all four of the figures I analyzed in this article use color as a dominant visualization strategy to differentiate between cases of a given disease/infection and deaths resulting from that disease/infection when depicting the spread of the Ebola outbreak that began in West Africa in 2014.

All four of the *NYT* infographics I analyzed used warm colors to communicate deaths conveying a sense of "active," "hot," "vibrant," "emotional," and "sharp." More specifically, red is used in Figure 1 (map of outbreaks in Guinea, Sierra Leone, and Liberia), Figure 2 (map showing infections diagnosed outside of Africa), and Figure 3 (line graph comparing number of infections to deaths in Guinea, Sierra Leone, and Liberia over time). Also, yellow and orange are used in Figures 2 and 4, respectively (but not Figure 3). Such design factors could have implications for how readers from different cultures respond to the information presented in these infographics.

In Western cultures, warm colors (particularly red) are often powerful signifiers of danger or warning, which, along with the use of shading in Figure 1 and Figure 4 (the timeline noting when an outbreak occurred and the related map noting where the outbreak occurred), in all likelihood increased the perceived level of risk among these viewers. Using shading to visually communicate increasing density of a particular variable has long been an established visual convention (Friendly, 2008). Using a warm color can also intensify this effect. For instance, unaffected areas are shown in Figure 1 (map of outbreaks in Guinea, Sierra Leone, and Liberia) in a "peaceful" and "calming" shade of white. The hues in this infographic then grow darker (moving to beige, then to brown, then to dark brown) as the number of cases increases, and they shift to a dangerously dark and arguably more urgent shade of red (at 500+ cases) to indicate the highest number of cases. Figure 2 (map showing infections diagnosed outside of Africa) represents individual deaths as small red squares that stand in strong contrast to the "recovered" patients as depicted by equal-sized small green squares that appear on the same map in greater number. In this case, the use of the cool color green, visually communicates these patients are no longer in danger. Conversely, in Figure 2 small, yellow squares are used to depict where individuals are "in treatment," and the use of this warm yellow color could—inadvertently—visually suggest there is still a cause for concern.

In Figure 3 (comparative line graphs for number of infections versus deaths in Guinea, Sierra Leone, and Liberia), the data (that is, line) used to indicate number of individuals infected is light gray, while the line used to indicate deaths on each of the three graphs is bright red. In each of the three nations noted in this visual, the number of cases is substantially higher than the number of deaths in two out of the three countries (Liberia and Sierra Leone, respectively), and each of the line graphs in the overall infographic notes the exact number of cases versus deaths for each nation. In all three line graphs, the bright red, line indicating "number of deaths," however, visually emphasizes the increasing number of deaths in contrast to the lighter gray line showing number of cases/individuals infected. In the line graphs for Liberia and Sierra Leone, the number of cases is three times the number of deaths, but the number of deaths assumes a higher level of visual importance because the creator of this infographic used a bright red line juxtaposed against a dull gray one.

Figure 4 (the timeline of outbreaks over the maps of where the outbreaks occurred), too, uses a warm color (orange) to show deaths, highlighting death as the more severe outcome in contrast to the lighter

shade of orange used to show cases of infection. In the context of this infographic, the difference between cases and deaths is more visually pronounced in the 2014 epidemic because the numbers are significantly greater, thus, the corresponding circles used to plot them on the timeline are much larger than all of the others that appear there.

In all likelihood, the warm colors used in all four of the figures (particularly the use of the color red) would seem to increase risk perception. This is because these colors are interpreted cross-culturally as "active," "hot," "vibrant," "emotional," and "sharp." As such, these colors—and the infographic features that use them—more readily draw viewers' attention and have the potential to elevate perceived risk. In contrast, a cool color scheme dominated by greens and blues would have conveyed the opposite visual message. As such, infographics that used such colors to convey the same data (even in the same forms—for example, maps, line graphs, and timelines) might lower perceived risk among individuals because, as research notes, audiences from different cultures tend to interpret these colors as "peaceful," "gentle," and "calming." Thus, considering the rhetorical effect of warm and cool colors is an important design choice for technical communicators who construct visuals used to convey aspects of risk to audiences from different cultures.

Aspects of High versus Low-Context Cultures

Aspects of high and low-context cultures are a second factor that technical communicators should consider when creating visuals used to convey risk in global contexts. From this theoretical perspective, high-context cultures are classified as using less explicit and more indirect methods for conveying ideas and information because meaning is usually inferred from the situation in which the communication occurs. As such, the context in which an interaction takes place provides meaning to the interaction versus the words uttered during the exchange (Hall, 1976). Communication styles in China and Japan, for example, have been characterized as high-context because meaning is gleaned from the situation in which the communication occurs and not from the message itself (Hall, 1976). In these cases, one individual might not directly state key aspects essential to the exchange, for the other party is expected to "fill in" the details/missing information based on the context in which the parties are interacting.

The inverse situation tends to be true among low-context cultures where information can not necessarily be intuited from the context in which information is presented; thus, all details need to be conveyed as explicitly as possible to ensure the correct message has been conveyed (Hall, 1976). As Hall (1976) explains, in low-context messages: "the mass of the information is vested in the explicit code" (p. 91). Certain European countries (for example, Germany and the Netherlands) and the U.S. have, for example, been characterized as low-context cultures because in an exchange, meaning is explicitly conveyed through the message (that is, one "says what one means").

While the categories of high and low-context have generally been used to describe language-based communication strategies, they can also be applied to visual forms of communication. Visual communication is often high-context. As Kress and van Leeuwen (1996) point out, the meaning of visuals often seems intuitive because we already know how to "read" them. As a genre of visual communication, data visualizations are high-context because creators frequently assume that readers will know how to interpret them without a great deal of explicit explanatory information. Indeed, Kostelnick (2004) argues that atlases depicting U.S. census data created in the late 19th and early 20th centuries taught public audiences how to read many statistical graphical forms. During this time period, readers were often assumed to be readily familiar with some genres (for example, maps and line graphs) so minimal description was included when using these genres to convey information. Conversely, other visualizations (the pie chart, for instance,) were less common to many users at the time; thus, additional textual explanations were often included to ensure that audiences understood these visuals correctly. In the twenty-first century, such detail is often no longer necessary, Kostelnick explains, because most readers already know how to interpret these graphics.

The *NYT* infographics I examined for my analysis demonstrate the ways that data visualizations function as a type of high-context visual communication. For instance, Figure 1 (showing outbreaks in Guinea, Sierra Leone, and Liberia) is high-context because there is very limited additional explanatory (that is, textual) information both within the infographic itself (only the names of nations and two capitol cities are included) and in the accompanying article. In other words, this

visual is not directly explained. Rather, viewers are expected to intuit its meaning from the other visuals and the text of the article. While Figure 2 (map of outbreaks outside of Africa) and Figure 4 (timeline of outbreaks with comparative maps) do include annotations that describe these visuals, the entry (both the article and the visual) contain limited information (language-based or visual) that directly explains what these visuals mean.

High-context forms of visual communication, like Figures 1-4, communicate a higher level of risk to intercultural nonexpert audiences. This is because the information about disease spread as conveyed in these infographics is presented primarily in terms of numeric values with limited explicit explanatory information. For instance, Figure 1 (the map of outbreaks and deaths in Guinea, Sierra Leone, and Liberia) shows the density of cases in three West African countries in stark visual terms by using a warm color scheme of beige, brown, and red. The space is visually portioned into these numerically-defined categories with no additional detail (total population, for example) to qualify the severity of the epidemic. Figure 3 (comparative line graphs for rates of infections and deaths in Guinea, Sierra Leone, and Liberia) and Figure 4 (timeline of outbreaks with parallel map of where outbreaks occurred) also use visualization strategies that construct risk nearly exclusively through numeric values and without explicit explanatory information. For example, in Figure 3 (comparative line graphs), cases and deaths are reported for each country as well as the dates for when they occurred. Figure 4 (timeline with maps) shows cases and deaths along a timeline, beginning with the first outbreak in 1976 and ending with the outbreak that began in 2014.

Thus, rather than visually communicating that the outbreak that began in 2014 was under control, these four figures show the situation growing progressively worse. If one were to review these four infographics, it would look like the numbers of both cases of infection and deaths from Ebola were increasing (Figures 1 and 3) with no indication of decline (Figure 3) as well as spreading across continents (Figures 2 and 4). Figure 2 (map of cases outside of Africa) in particular reinforces this message because this infographic visually inherently extends the reach of Ebola to the global level through the use of a map depicting other continents and regions. The use of this more global map suggests this highly feared, lethal pathogen was spiraling out of control. Providing additional direct and explicit explanatory information for high-context data visualizations is another strategy that technical communicators can use to lessen risk perception when sharing information with audiences from other cultures.

Factors of Individualistic versus Collectivistic Cultures

Individualism versus collectivism, a facet of cultural communication expectations proposed by Hofstede (1983), offers the final analytical perspective that technical communicators should take into account when creating visuals to convey concepts of risk to intercultural audiences. This facet of intercultural communication focuses on whether a particular culture places more value on the role of individuals or the individual's obligations to society/to the group. Much like high and low-context, this category has also often been applied to language-based forms of communication. For instance, Asian countries that tend to value groups and networked relationships have been described as more collectivistic cultures. In contrast, Western countries that tend to value the autonomy and the independence of the individual over what is best for the group have been described as individualistic. (Such cultures would include the U.S.)

Research in intercultural communication has pointed out that culture is often narrowly defined by nationality (see Jameson, 2007). Yet *culture* can also refer to the shared beliefs, interests, and values of a group defined by other characteristics such as ethnicity, gender, or even socio-economic status. Envisioned through this broader perspective, I suggest that researchers in the field of public health constitute a particular disciplinary cultural group that is inherently collectivistic because public health is the study of health promotion and disease prevention in populations. As Stroupe and Berkelman (1998) explain: "While clinical medicine has the individual as its focus, *public health* is fundamentally concerned with preventing disease, disability, and premature death in the population or community" (1). Thus while clinical medicine is exclusively concerned with treating individual patients, public health emphasizes relationships among aggregated quantitative information about groups, placing value on how to best manage disease in the population and not the individual.

As a dominant form of visual communication in public health, data visualizations tend to reflect this collectivistic perspective. This is because public

health researchers often create these graphics to consolidate abstract data into meaningful, concrete visual representations. The objective is to create visualizations that they can employ to hypothesize trends, draw inferences, and (ultimately) make public health decisions. According to these perspectives, I argue that the four figures I analyzed for this project are collectivistic. They are so because they all show geographic (Figures 1 and 4) and temporal (Figures 3 and 4) patterns of disease spread. Both of these factors convey ideas and information in terms of what they mean for the groups affected by and the greater audiences concerned about this particular situation. (This is in opposition to an approach that might focus on providing each individual with person-specific information related to each individual's own, personal situation or context.)

This collectivistic perspective is fundamental for managing outbreaks. This is because when working in this area, researchers need to make effective decisions involving the well being of groups of persons versus focusing on the individual needs and expectations of all members in that group. Yet this collectivistic perspective also aligns with how experts perceive risk. This is because the collectivistic perspective emphasizes risk as a quantitative value, which increases risk perception among nonexpert viewers (particularly those in individualistic cultures) who tend to view risk in terms of how it might personally affect them. For instance, Figure 1 (map of Guinea, Sierra Leone, and Liberia), Figure 3 (line graphs comparing rates of infections versus deaths in Guinea, Sierra Leone, and Liberia) and Figure 4 (timeline of outbreaks and related map of outbreak locations) depict risk from an entirely collectivistic perspective. Only Figure 2 (map noting infections diagnosed outside of West Africa) might convey an individualistic perspective by documenting the locations of the 24 individuals diagnosed with Ebola outside of West Africa. At the same time, Figure 2 also does not account for the social and cultural concerns of nonexpert audiences. This is because Figure 2 does not provide detailed explanatory information, such as what officials will do if more people are infected outside of West Africa. More specifically, in order to mitigate risk perception, nonexperts need to know what they can do to protect themselves and their families (if anything), which is something not conveyed in this visual.

Thus, rather than diminishing risk perception by showing an individualistic perspective, Figure 2, in fact, increases nonexperts' sense of risk by not providing information about actions they can take to decrease their risk. Figures 1, 3, and 4 show aggregate data, and thus nonexpert viewers could not identify with the individual people affected. However, because Figure 2 shows details about individuals, nonexpert viewers might perceive higher risk. This is because the possibility of being infected became increasingly real, particularly if the infected individuals were in close proximity.

This last aspect of cultural communication, individualism versus collectivism, illustrates how data visualizations can frame risk from a collectivistic or individualistic perspective. Infographics like Figure 2 (the map showing the locations of individuals diagnosed outside of West Africa) shows this particular risk affecting individuals, while the other figures included in this analysis show risk affecting groups. This aspect influences how risk is perceived because nonexpert viewers will perceive visuals like Figure 2 as a more individualized representation of risk. Being aware of how visual choices create this particular rhetorical effect is also important for technical communicators to consider when designing visual risk information for intercultural audiences.

Strategies For Desiging Risk Information For International Audiences

The results of the rhetorical analysis I conducted suggest the design strategies used in Figures 1-4 may have inadvertently increased risk perception among international audiences. Thus I propose the following strategies for guiding technical communicators in constructing data visualizations for audiences from other cultures:

1) Show Quantitative Information Using a Variety of Visualization Strategies

Warm or cool color choices can dramatically influence the way that quantitative risk information is shaped and subsequently perceived. Thus technical communicators might use warm colors to increase risk perception in certain scenarios such as smoking cessation materials where the objective is to convey a high risk of lung cancer among patients who continue to smoke. Cool colors, on the other hand, might be used to decrease risk perception when the audience is already anxious

about the risk. Still other colors such as gray and brown might be interpreted as more "neutral" by viewers, and thus might be more appropriate in crisis and emergency risk scenarios where risk perception is already high, and technical communicators want to downplay the risk.

Similarly, perspective can also substantially shape the perception of risk particularly in maps used to communicate risk on a geographic scale. Disease maps frame "diseased space" in particular kinds of ways (Welhausen, 2015). Thus including maps that show large geographic areas visually conveys to viewers that the risk is potentially present throughout the entire space depicted. When there are very few cases of a condition in a particular geographic area and/or the cases pose very little risk, technical communicators may want to avoid visualizing the entire geographic area. In such instances, they could instead consider representing the information using alternative visualization strategies. For instance, a table used to convey information on infection rates and deaths from a disease on a country-by-country basis might be a more effective method to communicate information about the global status of a disease versus a regional or a world map.

Different data visualization genres such as maps, line graphs, and bar charts emphasize different types of relationships among data. Thus technical communicators should carefully consider:

- The specific relationship they want to visually construct
- How this representation is likely to influence risk perception

For instance, maps like those shown in Figures 1, 2, and 4 emphasize spatial relationships. Thus using maps like those analyzed here visually communicate disease spread and increasing risk (even though the map in Figure 2 was probably created to convey the opposite) throughout the space depicted.

2) Include Explanatory Text and/or Visuals to More Fully Contextualize Data Visualizations

Researchers in risk communication have argued that nonexperts perceive risk more broadly than experts. However, experts' perception of risk may not be as narrowly conceived as this idea suggests. Experts tend to assess risk in terms of probability, which focuses on numeric values. Yet assessing probability is not limited to mathematical calculations. Rather determining probability takes into account other contextual factors that directly influence these numeric values.

For instance, during the Ebola outbreak that began in 2014, health care infrastructure and access to protective gear were significant factors in determining the likelihood as well as the extent to which the disease might spread beyond West Africa. Risk assessment from an expert-level perspective then involves not only considering increases or decreases in the actual number of cases and/or deaths in a particular region (and over a particular time frame). Rather, it involves evaluating this numeric data within the context of other information. Such information might substantially increase or decrease overall risk in the potentially affected population. Thus expert viewers often interpret the risk shown in data visualizations through a comprehensive risk assessment strategy. Nonexperts, on the other hand, do not necessarily have access to information about other factors or a scientific understanding of how these factors might change the nature of the risk. When trying to address and convey risk effectively in global contexts, such factors matter a great deal for coordinating effective actions across regions and nations requires the understanding and cooperation of relatively sizable numbers of experts and nonexperts alike. Thus, in global contexts, effective data visualizations need to create a sort of "common ground" for how experts and nonexperts perceive the risks associated with a given situation. For technical communicators creating visual risk information in crisis and emergency risk scenarios, the challenge is often to downplay risk perception in international contexts. To do so, they should include additional explanatory information (visual and/or language-based) for nonexperts.

To make the point: Two of the visuals included in this analysis (Figures 2 and 3) do include textual annotations that provide explanatory information, while Figure 4 provides additional visual information. More specifically, Figure 2 includes the names of cities (as well as treatment facilities in the U.S.) where cases were treated as well as brief descriptions of several of the cases shown on the map. Figure 3 includes annotations with total number of cases and deaths as well as the exact time period. Figure 4 provides illustrations of the African continent for the five outbreaks, visually situating each within a specific, visually-defined geographic space. However, none of these figures

includes additional information about the factors previously mentioned that drastically influenced the spread of Ebola: existing health care infrastructure and access to protective gear.

Adding visual or language-based annotations that specifically includes this type of information is a second strategy that technical communicators can use to more effectively manage risk perception. For instance, Figure 2 (map of cases diagnosed outside of West Africa) might have used smaller boxes to show cases in order to include a short description of the hospital and its capabilities in each area of the map where affected patients were being treated (as well as used a series of maps instead of a single large map in order to include more detailed contextual information). While a table that accompanied the map in Figure 2 did give a timeline of these cases and their status, it did not give detailed information about relevant treatment facilities that led to the high recovery rate shown. Figure 3 (comparative line graphs of infection rates and deaths in Guinea, Sierra Leone, and Liberia), too, might have included additional information. This could have included improved access to protective gear in each country (as applicable—and assuming that access to protective gear improved as the outbreak worsened over the timeframe shown). Figure 4 (timeline of outbreaks since 1976) might have shown hospital coverage in the affected areas in the maps of Africa under each outbreak depicted. This figure might also have included textual annotations about improvements in care since the last epidemic (as applicable).

3) Add Comparative Data Visualizations

Technical communicators might consider adding comparative information when using data visualizations to share information about risk factors with global audiences. Lipkus and Hollands (1999), for example, found risk ladders [a chart that shows the numeric values of a particular hazard(s) in descending numeric order; that is, the highest level of risk is shown at the top and the lowest at the bottom] were particularly effective in communicating "risk magnitudes" (p. 155), and that viewers tend to perceive information at the top as riskier. Lipkus and Hollands therefore suggest including comparative information (that is, details that relate the risk shown in the ladder to other risks that viewers are already aware of) may help to minimize this effect.

In a similar vein, technical communicators could include comparative information (either visual or language-based) when showing data visualizations that depict risk in crisis and emergency risk scenarios. For instance, technical communicators might compare the risk of getting Ebola with the risk of getting another communicable disease that is generally not perceived as dangerous or life-threatening. During flu season, for example, the risk of infection can be very high. Nonexpert audiences, however, generally do not perceive this disease as "high risk" because people often get the flu, and its symptomology is generally not severe. This is because the flu is non-lethal for most of the population, and overall the consequences of being infected, though unpleasant, are usually tolerable. Thus including comparative data visualizations of the most recent seasonal flu data for particular geographic regions of the United States and/or Europe to contrast with the information in Figures 1, 3, and 4, for instance, could have lessened how international audiences perceived the risk posed by Ebola in 2014 by situating it within a broader context. Doing so could have allowed nonexperts to compare the two risks in similar visual formats and come to more effective understandings about the actual risks involved with the situation.

Conclusion and Implications

Sociologist Ulrich Beck's (1999) concept of a "world risk society," which is simultaneously "…global, local, and personal" (p. 5), arguably anticipates the cross-cultural crisis and emergency risk communication scenarios of the twenty-first century. While the Ebola outbreak that began in 2014 did not grow into the large-scale pandemic many feared, such a scenario is certainly possible in the future. As public health efforts to control epidemic disease are increasingly enacted globally, understanding the ways that risk messages influence risk perception among culturally divergent audiences will continue to be important for technical communicators.

Risk perception is often deeply grounded in the level of control that viewers believe they have over the risk, particularly for nonexperts. Such perceptions are also shaped by cultural beliefs about disease and health. In Western countries, "containment" is the dominant metaphor for attending to epidemic disease (Welhausen, 2015, p. 274). As a result, the members of these cultures tend to adhere to a biomedical model for addressing disease (see also Segal, 2005)—that is, a framework that sees health as the absence of disease and disease as

external to the body. Thus either visually reinforcing containment or a lack thereof is an important communication strategy for technical communicators to consider when constructing risk information about epidemic disease for viewers in these cultures.

For instance, a technical communicator creating online educational materials for parents about the MMR (Measles, Mumps, and Rubella) vaccine may want to reinforce containment (and thus communicate reassurance) by including interactive line graphs and maps that show declining incidence of these diseases over the past several decades. She might also choose to use a warm color like dark red to show higher rates at the beginning of the timeframe and then shift to cooler colors as rates decline. Conversely, if her rhetorical goal is to increase risk perception, she might visually show lack of containment by including national maps showing recent outbreaks of measles, for instance, or increasing incidence over the past decade in specific geographic area(s) where vaccination rates have been more lax. Technical communicators might also use a combination of these strategies depending upon the specific rhetorical situation.

Non-containment can also be an effective risk message for technical communication targeted to more knowledgeable viewers like public health decision-makers and government officials. For instance, while the figures included in this article may have increased risk perception among nonexpert audiences, technical communicators may want to use a similar visual risk message combined with a verbal message emphasizing lack of containment to persuade these viewers to allocate more resources to controlling a particular epidemic.

While containment is an effective visual risk communication strategy in Western cultures, this strategy may be less effective in non-Western cultures that see health and disease holistically—that is, as an imbalance *within* the body. These viewers may interpret control over risk of epidemic disease as internal, assigning more responsibility to individual behavior. For instance, China's first "imported case" of H1N1 during 2009, a graduate student studying abroad who had recently returned home, experienced a significant online public backlash for potentially putting others at risk (Ding, 2013). Ding explains that this case prompted unofficial risk communication that encouraged other students to wait before returning or to self-quarantine upon arrival, reinforcing containment as personal responsibility. In this type of situation, technical communicators might avoid creating visuals that highlight specific cases (like Figure 2, the map showing cases of Ebola diagnosed outside of West Africa)—for such visuals might increase risk perception as well as contribute to blame directed toward specific individuals.

In this article, I have examined how data visualizations can profoundly influence risk perception in global contexts. In so doing I have presented certain strategies technical communicators use when creating such visuals for international audiences. The guidelines I propose offer a model technical communicators can use to align the design choices they make with the expectations of individuals from other cultures. These guidelines can serve as an initial mechanism for addressing aspects of risk communication with global audiences.

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App Abroad and Mundane Encounters: Challenging How National Cultural Identity Heuristics Are Used in Information Design

By Benjamin Lauren

Abstract

Purpose: The goal of this article is two-fold:

- It argues technical communicators can challenge current models and/or approaches of how to design materials for international audiences.
- It explains how technical communicators might consider using a technique offered by a mobile application called App Abroad to document commonplace cultural interactions to support reflection from users from different cultures.

Methods: The article draws from technical communication theory and practice to explain a bottom-up method of designing effective materials for international audiences.

Results: By creating opportunities to document cultural encounters through media that can convey the complexity of face-to-face communication, readers learn to seek a more bottom-up approach to understanding culture.

Conclusion: Because culture is not static but constantly transforming, technical communicators must challenge traditional models that seek to address culture from the perspective of a single, national cultural identity. Rather, a more "bottom-up" (that is, not predetermined) understanding of cultural communication practices is needed to help technical communicators create more effective materials for international users. A bottom-up understanding of culture can support improved intercultural technical communication outcomes.

Keywords: international, culture, identity, applications, heuristics

Practitioner's Takeaway

Practitioners will learn of

- New, user-centered models and methods for creating materials for participants from other cultures.
- The problems associated with using more traditional or conventional models of and approaches to national cultural identity when designing effective materials for users from other cultures.
- New methods of using technology to individually and collectively learn about the specific users – or groups of users – within a larger, national culture.
- The use of bottom-up encounters as a method for learning about the expectations and conditions of use encountered by individuals in other cultures when they use different materials and technologies.

Benjamin Lauren

Introduction

Theory-based models of intercultural communication, often referred to in the research literature as "cultural identity heuristics," are used by technical communicators to guide the design of effective texts and interfaces. The heuristic approach can be traced to Hall's (1976) high-context/low-context communication model and Hofstede's (1984) cultural dimensions. Hunsinger (2006), however, challenges technical communicators to question traditional heuristic approaches because they fail to distinguish among the preferences of individual users within a larger cultural group. This limitation, in turn, affects how well technical communicators can create materials that meet the needs and expectations of users in different regions of the world.

This article examines how a mobile application under development, App Abroad, challenges heuristic approaches and works from the bottom-up to develop cultural competence – or an understanding of the expectations and preferences of individuals from other cultures. The article extends previous work by Rice and Lauren (2013), which closely examined how an earlier conception of the app could facilitate transactional dialogue between users of study abroad and exchange programs to create gains in intercultural competence. This article extends this previous work by explaining how the latest iteration of App Abroad works to build cultural competence through a process of beginning with a model (that is, heuristic) of how individuals from other cultures communicate. Features of App Abroad then challenge such models through on-location encounters with individuals from an unfamiliar culture (that is, a culture whose social rules, communication practices, beliefs, and norms are new for users). In reviewing the latest iteration of this technology, the article explains App Abroad as a reflection tool technical communicators can use to assemble a more bottom-up view of the communication practices of unfamiliar cultures. Additionally, the article will address how study and working abroad experiences provide an important context for learning how App Abroad can help facilitate gains in cultural competence, and for this reason, the article will discuss specific examples of how App Abroad can be used in such contexts.

The goal of this article is two-fold:

- It argues technical communicators can challenge current models and/or approaches of how to design materials for international audiences.
- It explains how technical communicators might consider using methods offered by a mobile application called App Abroad to individually and collectively learn about the specific users – or groups of users – within a larger, national culture.

In addressing these two objectives, this article seeks to answer the overarching research questions of

- How can technical communicators and technical communication students move beyond traditional models of culture and communication/cultural identity heuristics and improve cultural understanding of users?
- How can technical communicators working in international contexts adopt bottom-up, user-centric approaches in their work?

The article begins with a review of the literature on cultural identity heuristics to explain why such models can be problematic and beneficial when designing materials for audiences from other cultures. The article then discusses how study abroad programs can serve as valuable sites for collecting new information and support gains in cultural competence through immersion and reflection. (In so doing, the author will also note how the results of such interactions can contribute to technical communication practices.) Next, to apply these ideas to a specific case, the article will describe how App Abroad functions to explore the gap between individuals and their national culture by examining what Patricia Sullivan (2014) calls "mundane encounters" with culture. The article then concludes with a discussion of how technical communicators working in international contexts can draw from these ideas and improve communication outcomes. By considering how interactive technologies such as App Abroad function to support gains in cultural competence, the article helps readers understand how to seek similar encounters with those who identify with different cultures. The article also provides technical communicators with a method for exploring the gap between individual users and the greater culture with which that person associates.

An Overview of Heuristics

Heuristics are a set of guidelines or strategies used to efficiently evaluate information, systems, data, and so on,

and many information designers use them as a starting point to guide the development of different technical communication projects. They are created by subject-matter experts, usually through a great deal of research that points to generalizable trends about users, use, or design. The benefit of employing a heuristic approach is they can be useful guidelines for non-experts as a starting point for technical communication projects across cultures. Cultural identity heuristics, for example, can help technical communicators design complex information for unfamiliar cultures by guiding choices about graphics, typographical elements, and color scheme. Using cultural identity heuristics affords technical communicators the ability to more efficiently refine information design over time. In this way, heuristics are best utilized as a guideline for design rather than a rule.

In the field of technical communication, heuristics are often used to determine the usability of Web sites and user interfaces (Nielsen, 1995), designing materials for audiences from other cultures (Hofstede, 1984), and guiding the process of designing visuals for different audiences (Williams, 2014). For example, visual designers in a software company can use Williams' (2014) contrast, repetition, alignment, and proximity design heuristics to evaluate the existing visual elements of a user interface. Similarly, these same designers can draw from both Nielsen's (1995) usability heuristics and Hofstede's (1984) national cultural identity model to help further evaluate the interface for specific audiences. These heuristic evaluations can then be compared to user experience data collected through Web analytics, usability testing, and other relevant sources of information. In such contexts, heuristics are perhaps best employed as one tool in a variety of development methods that involve users. They can also be useful sources of information and insights in situations where research cannot or will not be conducted. However, when used as the only method of evaluating information design, heuristic approaches have the potential to create as many problems as they aim to solve by glossing over nuance (for example, failing to account for aspects such as regional differences in color preferences or language practices).

Cultural Identity Heuristics

Heuristic models have been developed to support theories and mechanisms for understanding different cultural values and beliefs. For example, Edward T. Hall (1976) asks, "So how does one go about learning the underlying structure of culture?" (p. 92), and answers by explaining the importance of consistency in observing "cultural systems and subsystems" like the military, marriage, workplaces, and so on (p. 92). To observe these systems requires understanding Hall's high-context and low-context continuum. "A high-context (HC) communication or message is one in which most of the information is either in the physical context or internalized in the person, while very little is in the coded, explicit, transmitted part of the message. A low-context (LC) is just the opposite; i.e., the mass of the information is vested in the explicit code" (Hall, 1976, p. 79).

The advantage of Hall's (1976) context approach (that is, heuristic) is technical communicators can work to interpret how a culture communicates by using a high-low-context continuum to map a communication patterns and expectations across institutions, groups, teams, and individuals. Yet, Hall's model provides generalities that can too easily become cultural stereotypes, making it convenient to marginalize people (for example, everyone in German culture is high context) instead of seeing them as individuals. In this approach, a person's culture reduces their behavior and needs to a nonspecific generality – that of an overall group – that could likely work against increasing cultural competence and providing valuable customer experiences. Additionally, scholars like Cardon (2008) and Kittler, Rygl, and Mackinnon (2011) have critiqued the high-low-context approach conceptually for lack of empirical evidence and rigor in how it was developed. Such critiques are careful to recognize the general usefulness of the theory, but they also argue that more empirical research is required to test the broad application of the concept, and this especially true when shaping effective intercultural technical communication.

Popular approaches of designing effective intercultural technical communication also rely on categorizations and concepts that can be used as a heuristic, such as the dimensions of cultures model first forwarded by Hofstede (1984) and recently revised by Hofstede, Hofstede, and Minkov (2010). Here, the authors describe a mechanism for understanding cultural differences as dimensions of cultures. "A dimension is an aspect of a culture that can be measured relative to other cultures" (Hofstede, Hofstede, & Minkov, 2010, p. 31). This particular body of work identifies four dimensions of culture: power distance; collectivism

versus individualism; femininity versus masculinity; and uncertainty avoidance. Similar to Hall's (1976) work, each dimension can be traced across a continuum that represents each culture numerically so difference is highlighted and "they become points in a diagram" (p. 31). Further, "A dimension groups together a number of phenomena in a society that were empirically found to occur in combination, regardless of whether there seems to be a logical necessity for their going together" (p. 31). Unlike Hall's (1976) work, the dimensions of cultures heuristic has rich empirical support that has been developed over the years (for example, Hofstede, 1980; Hofstede, 1983; Hofstede & Bond, 1984; Hofstede, 2001). In the 2010 revision of Hofstede's *Cultures and Organizations*, for example, the authors work to directly address the profiling of individuals by comparing them with national culture scores, ultimately arguing, "National culture scores are not about individuals, but about national societies" (p. 40). In other words, the dimensions of culture approach was not meant to evaluate the relationship between a person's culture and their national cultural identity. Instead, the authors firmly assert that the relationship between a person and their national cultural identity is not absolute. Yet even with such caveats, such approaches to culture can still prove problematic – particularly in terms of addressing the needs and expectations of individual users.

Problems Presented by Heuristics

For reasons such as those mentioned above, Peter Hunsinger (2006) challenges technical communicators to question heuristic approaches because they often leave complexities between a person and their national cultural identity unexplored. Specifically, Hunsinger (2006, p. 33) cites researchers who claim the heuristic approach can pigeonhole individuals as members of a strict profile (Weiss, 1998), misrepresent the cultural identity of individuals by calling too much attention to stereotypical differences (Munshee & McKie, 2001), and under-represent others' perspectives through limited research or data (Beamer, 2000). Additionally, Hunsinger (2008) argues a heuristic approach "encourages cultural identity to be represented as effectively autonomous, independent of economic, political, and historical contexts" (p. 38) and turns to Appadurai's (1996) work to theorize the hybridization of cultural identity as not static but a flexible and ongoing synchronous exchange of imagined and understood realities. Thus, heuristic models are, at best, a starting point for understanding culture and communication, and they cannot be used as definitive methods for understanding such factors.

The key is to understand the relationship of the individual to his or her culture. Technical communicators, for example, must recognize that the relationship between a person and their national cultural identity is not static and undergoes constant transformation. To understand these transformations, technical communicators might focus on what Holliday (2013) calls "small culture formation," which is "the formation of cultural behavior and reality at the small level of everyday interpersonal interaction, which relates to whatever is going on at the time" (p. 9). Turning attention to small encounters gives technical communicators an opportunity to challenge national cultural identity heuristics that "work from the top down" (mapping greater cultural factors onto the individual) instead of "working from the bottom up" (recognizing how the preferences of the individual might affect the greater national culture) (Holliday, 2013, p. 163).

User experience research provides a bottom-up approach to understanding the needs and behaviors of a person's encounters with information and how they assemble an experience around it. For example, participatory design, a "*process* that enables different participants to engage in designing [a] product" (Robertson & Simonson, 2013, p. 8), is one such method many technical communicators may have experience with. When using participatory methods, technical communicators create opportunities to design with users rather than relying on heuristics to guide product development. For example, a technical communicator might run usability tests as part of an iterative design process. While some cultures may find participatory methods work against their own values and beliefs, the method can be useful when used in appropriate circumstances and environments, such as during a corporate rebranding project, when rolling out new features of a product, or even for customer submitted errors in product documentation.

User experience methods like participatory design provide most value when implemented throughout product development, even though organizational constraints and applications can make the work more top-down instead of bottom-up. For instance, while still widely considered useful by user experience

researchers, personas can become problematic if they are not frequently updated to represent changes in user preferences, needs, and behavior. Thinking of personas as static is as problematic as adopting national cultural identity heuristics as representative of all people; that is, the needs and behavior of users continuously change in unpredictable ways. Technical communicators must therefore be prepared to recognize and respond to these ongoing shifts in ways that add value for users. It appears this is why Patricia Sullivan (2014) argues technical communication as a field must work forwards instead of backwards to understand users, explaining, "we need to find ways to encounter, listen, and learn" (p. 5). As a result, alternative approaches to designing information for international users have been offered.

Benefits of Heuristics

Marina Lin (2012) describes one such approach of encountering users through a creative application of mind mapping during usability testing. Lin explains that mind mapping can be employed as a nonlinear method of capturing the user experience during usability sessions. She also describes how visual cues are used to compare data across several usability tests and looks for visual similarities and differences. The approach she notes seems to have interesting applications for those users whose cultural context makes them less amendable to participatory methods. This is because she describes how researchers can work to capture the user experience individually and collectively. As she explains, "Another way to analyze mind-map data is to create one master mind-map to represent all of the participants. A single note-taker can use software tools to merge branches from individual mind-maps into one view, or this can be done by hand" (Lin, 2012, par. 13). Technical communicators can adopt Lin's (2012) approach by critically examining where users of a product align and diverge with national cultural identity heuristics or examining attitudes toward technology in general. In some ways Lin's ideas resemble the goals of collecting information on specific users in a culture, but she stops short of representing everyday cultural encounters through user-captured media.

Even so, cultural attitudes toward computing technology vary as shown in research by Vatrapu and Suthers (2007). The authors cite work by Lee (2004), which explains how users from Japan, Korea, and U.S. interact with Web differently. Ultimately, the authors argue, "Social interaction is strongly grounded in culture as every person carries within himself/herself patterns of thinking, feeling, behaving and potential interacting" (Vatrapu and Suthers, 2007, p. 268). These patterns make diverging from national cultural identity heuristic models when developing intercultural communication an increasingly complex, but necessary process.

These factors do not necessarily mean that the ideas of prior scholars in culture and communication cannot be useful to understanding such contexts. Some researchers, for example, have effectively applied Hofstede's (1984) heuristics to show trends in interface design in intercultural communication. A case in point: Aaron Marcus and Associates, Inc. (2000) provide detailed examples of how Hofstede's (1984) heuristics can materialize in user interface design in different countries around the world. The white paper they wrote concludes that "These trends and tendencies should not be treated as defective or used to create negative stereotypes but recognized as different patterns of values and thought" (p. 21). The paper also calls for the development of new tools that demonstrate versions of Web sites localized to different patterns of thinking and acting.

These uses of modified versions of more traditional intercultural heuristics have also been noted by Reinecke and Bernstein (2012). In their own work on culture and design, the two describe a system that is culturally adaptive called MOCCA, which is an online software platform that allows users to generate to-do lists. The initial goal for the system is to use algorithms to identify the cultural background of a user. Next, one can use this information to create a version of a Web site that draws from the cultural identity heuristics provided by Hofstede (1984). The challenge thus becomes finding a heuristic – or an approach to heuristics that acknowledges, and ideally addresses, both the individual and the culture in which that person lives and works.

Given such technological affordances and our increasingly globalized workplaces and societies, there is more need than ever to employ national cultural identity heuristics, but also, more need to refine how they are used to support communication. The challenges many study abroad programs face, in some ways, run parallel to the issues technical communicators confront when working to design effective intercultural communication. That is, like study and work abroad programs, technical communicators must work to build a bottom-up understanding of culture when

designing information experiences for people, even when drawing from national cultural identity heuristics. For this reason, an understanding of the study-abroad context, and the challenges of using technologies in such contexts, can help inform how technical communicators approach the idea of using heuristics to communicate in global contexts.

Challenge Of Working And Studying Abroad

Working in the unfamiliar environment of another culture – a situation that often results in "culture shock" – can make it challenging to navigate these new cultural experiences and create gains in cultural competence. Hofstede, Hofstede, and Minkov (2010) explain the effects of culture shock, when a person's values are confronted by the value systems of another culture. "This experience usually leads to feelings of distress, of helplessness, and of hostility toward the new environment" (p. 384). These reactions must be replaced with empathy, which is derived when a person is acculturated to their environment, "when the visitor has slowly learned to function under the new conditions, has adopted some of the local values, finds increased self-confidence, and becomes integrated to a new social network" (Hofstede, Hofstede, & Minkov, 2010, pp. 384-385). It takes time for a person to become acculturated to an unfamiliar environment.

Bennett (2004) provides a model for understanding such situations. Bennett suggests that there are stages of development that people move through as they work from an ethnocentric mindset (that is, using your own cultural context to evaluate others' beliefs and practices) to an ethnorelative one (that is, being able to understand others' beliefs and practices as culturally rooted). In the model, people don't begin to empathize with a culture until they adapt to it. "*Adaptation* to cultural difference is the state in which the experience of another culture yields perception and behavior appropriate to that culture" (Bennett, 2004, p. 7). In the short periods of time most people can devote to living, studying, or working in an unfamiliar culture, adaptation is difficult to achieve without ongoing immersion before, during, and after an experience.

Comparably, study abroad programs work to promote gains in cultural competence by immersing students in an unfamiliar culture. Duration of time abroad immersed in a culture influences the lasting effects of competencies gained. Dwyer (2004) conducts an inquiry into the duration of study abroad programs and concludes that while shorter programs of up to six weeks can provide significant student growth, "clearly the greatest gains across all outcome categories are made by full-year students"(p. 161). Vande Berg, Connor-Linton, and Paige (2009) similarly find that the greatest gains in intercultural development were related to duration. Immersion is important because it permits people to pass through stages of cultural understanding that begin with denial and end with integration (Bennett, 2004). These stages help people adopt a more empathetic mindset that seeks to understand a culture from the bottom-up rather than the top-down.

A prime challenge for study abroad programs and international organizations is the ability for people to arrange an extended time abroad to be immersed in an unfamiliar culture. People today lead rich, complex lives. College classrooms produce more students with children and/or other family obligations, who work full or part-time, and who take on extra research projects and other extra-curricular activities. At work peers are similarly busy. As a result, many people find it increasingly difficult to arrange the time to study or to work abroad.

Sending an employee overseas to immerse them in an unfamiliar culture for a period of time is both expensive and not practical. For those that are able to take the time to go abroad, they face the challenge of making sense of the experience in ways that will productively translate to the workplace. For example, Gardner, Gross, and Steglitz (2008) explain that students are notorious for compartmentalizing their study abroad experiences, and must learn to demonstrate how their experience is relevant to future employers. One way to construct this value is through making meaning of everyday encounters with different cultural practices. "Cultural practices can be defined as ways of doing something which relate to particular cultural environments and may therefore be unfamiliar to newcomers. They concern everyday activities where there are choices about eating, washing, clothing, communicating, timing, surroundings, being together, and so on" (Holliday, 2013, p. 6). However, without a flexible tool to capture these cultural practices, participants must rely on what they remember of various encounters, and memory can be enormously biased and unreliable.

For technical communicators designing information for international audiences, immersion in unfamiliar

cultures can help create more effective user-centered communication. Immersion, however, does not need to be limited to a single experience or encounter with another culture. Digital tools, like App Abroad, can be used to help document and create immersive experiences in ways that facilitate ongoing engagement with culture through user-captured media. Using such digital tools can support competencies that lead to an ethnorelative mindset, which assists in understanding culture from the bottom-up and can support improved outcomes for intercultural technical communication.

What Is App Abroad?

One major problem with learning from immersive experiences in other cultures is what we can remember when considering how to work effectively in different cultural contexts. The limits of our memory, unfortunately, affect how we later conceive of cultures when trying to plan strategies for interacting with the members of a culture or designing information for individuals in that culture. The reliance on memory to recall cultural encounters is the problem App Abroad attempts to address.

App Abroad is a mobile application for people interested in learning about other cultures and cultural contexts. The app presents one possible way of documenting everyday encounters with an unfamiliar culture through user-captured videos, photos, sounds, text, and creates opportunities to assemble juxtapositions of these collected artifacts. App Abroad positions users as students of culture as they document and discuss encounters with unfamiliar practices, values, and beliefs. It does this to facilitate gains in cultural competence by supporting bottom-up encounters with culture.

Facilitating a Bottom-up View of Culture

Pedagogically, the app treats national cultural identity heuristics similar to how user experience researchers deploy proto-personas in their work. "Whereas a classic persona is based on firsthand user research, a proto-persona is based on whatever insights you have, which can include secondhand research, or even the well-informed hunches of a team of people" (Buley, 2013, p. 132). In this situation, proto-personas can be seen as a type of heuristic, although Buley (2013) warns us they should not be mistaken for personas and researchers must "treat them as a hypothesis" (p. 135). Similar to proto-personas, national cultural identity heuristics can also be situated as hypotheticals or generalities that must be challenged through encountering cultural practices, especially the commonplace experiences of participating in unfamiliar environments. For example, perhaps there is cultural significance in the sound of a train as it passes just outside of town or seeing a mass of windmills as a train transports you to another city.

Instead of committing these encounters to memory, the app invites the user to collect them in different modalities, tag what was collected, and upload these artifacts to a feed where peers are also doing the same. For instance, a photo showing a mass of windmills near the coast of Ireland could potentially be tagged or annotated #FromIreland #ToCalifornia #ToMichigan #GreenEnergy #ItsAllAroundtheWorld. These tags can be used as a starting point for a conversation about the encounter. Users participate in these conversations by reviewing the artifacts in a real-time feed and then commenting on them, making connections between their individual and collective experiences, reactions, and ideas. This approach thus helps with an individual's memories of another culture by stimulating recall of everyday encounters easily overlooked or forgotten.

Theory behind the Practice

Sharing media with peer groups is a common form of educating students about an individual's cultural identity in intercultural communication pedagogy. Ware (2013) explains one such approach where students use media to exchange cultural information by sending each other videos, music, written letters, and photos as a way to share emotional ideas contextually. Complex ideas such as home, family, and spirituality can be represented in multiple modalities by participants, making abstract ideas more concrete, but in culturally revealing ways. While cultural attitudes, values, and beliefs might make Ware's (2013) approach less effective for some, the research appears to suggest user-captured media can be seen as a "natural" (Kock, 2005) form of communicating complex ideas across cultures because media has the potential to effectively communicate abstract ideas.

In this case, the term "natural" is adopted from Kock's (2005) article on media naturalness theory, which argues that human beings are biologically designed to be more effective communicators face-to-face. To support the argument, Kock provides five "elements" in support natural communication: colocation, synchronicity, facial

expression, body language, and speech. Also, each of these elements exists on a scale of degree (p. 121). If a communication produces a high degree of each element, then it can be seen as more natural and therefore, more effective. Drawing from media naturalness theory, App Abroad suggests user-captured media can provide a natural encounter with culture. While this user-captured media certainly provides a particular view of culture that in some ways is limited to the user group, the media collected has the potential to document experiences and encounters in an immersive way that promotes bottom-up rather than top-down understanding.

Using the App to Reflect

Traditionally, after working or studying abroad, a person relies on their own photographs, videos, and/or journal entries as a way to stimulate recall of their experience. App Abroad supports recall as a collective and individual effort. Users capture their experience by recording sounds and taking videos, photographs, and notes. Users then upload this media to a feed and tag it as a way to create a discussion among peers about the cultural encounter. The goal of the dialogue is to support a bottom-up discussion about cultural beliefs, values, and practices, and to challenge national cultural identity heuristics. Later, once their experience has concluded, users can go back to the app to review its media stream as an interactive timeline of the experience. In this way, user-captured media has the potential to support cultural immersion even after a study or work abroad experience has ended. Technical communicators can take a similar approach, using immersive media to encounter cultures and to challenge the generalizations forwarded by national cultural identity heuristics.

An experience I recently had during a trip to London helps to further illustrate how App Abroad can be used to facilitate critical reflection on cultural identity heuristics. I recorded the sound of Big Ben on my smartphone. Later, when I recalled walking down the street and hearing Big Ben without listening to the recording, I most remembered how quiet the chime seemed. For some reason, I had expected Big Ben to sound much larger. When I played the audio file, I heard how much traffic there was on the street that night. The audio file captured the sound of squeaking automobile brakes. This information certainly qualifies as a mundane encounter with culture, but it also provides value for those studying culture in several ways. First, my memory of that moment and the audio recording of it offered rival interpretations of the experience. I remember Big Ben as quiet, but I didn't remember the car brakes. Also, the audio recording captured the sound of talking, which reminded me that there were several people out walking that Saturday night. I had forgotten how I had looked to those people when crossing through St. James Park at dusk because I wasn't certain it was safe. The audio recording stimulated recall of my experience that had been forgotten. Had I shared that experience with others, what might they have heard? How would my interpretation of the experience conflicted and agreed with their experience?

As well, much of my reaction to this recording of Big Ben could be further interrogated against my own national cultural identity. Americans are reported to be individualistic, which means they tend to favor the individual over the group (Hofstede, Hofstede, & Minkov, 2010). Perhaps my reaction to Big Ben was more about meeting my own predetermined expectations of how the chime should sound? Maybe my reaction to the park at dusk was based on my concern for my own safety? Or, maybe my reaction was based on previous experiences in other large city parks at dusk? These rival explanations are important when encountering culture and working toward empathy. To create this sort of reflection, App Abroad works to stimulate recall in ways that challenges perceptions and viewpoints through user-captured media. By stimulating recall, the app functions as a memory system for cross-cultural encounters. Through tagging this user-captured media and sharing it for continued conversation, App Abroad creates opportunities for intervention, reflection, and discovery. Using tools like App Abroad to support constructive dialogue about cultural communication practices can lead to deeper understanding of cultural values, beliefs, and norms. Such dialogue can occur across a team of technical communicators to develop important rival explanations of user behavior and needs. Also, collectively reflecting with peers on everyday encounters with cultures is a way technical communicators can work to better understand how their own individual cultural identity influences the information they design.

App Abroad as a Memory System

People use memory systems to recall lists, directions, phone numbers, names, and so on. When someone recalls a password like Irdtb67t! for an online account,

it has become common knowledge to use a memory system to remember it (for example, construct a phrase like 'I ran down the block 67 times!'). Memory systems were taught to communicators in ancient Greece as a way to remember speeches in public settings, but contemporary computing devices have changed our application of memory systems. Phone numbers, addresses, and driving directions no longer require memorization because a phone can do this work instead. On the other hand, mobile phones can make recalling mundane details more challenging. As a result, mobile devices are often used to archive of all sorts of experiences through media in the form of photographs, videos, sounds, and written notes. It is not uncommon to see peers writing notes on a mobile device during a meeting just as it is not uncommon to find students designing communication or doing homework on the small screen of their smart phone. Today mobile devices are intimately involved in constructing and documenting experiences and collecting memories. Such factors are of importance to technical communicators working in interface design because the use of these tools can significantly vary by culture.

Mediating memories can lead to several accounts of an event depending on the amount of participants involved in creating the memory. In some cases collective memory can even lead to fiction, similar to how the presence of a researcher can impact the behavior of a research participant. "The anticipation of exteriorizing memory within media can also, of course, significantly impact the staging of the event being captured, molding it to the benefit of its status as a future source of recollection and to the potential detriment of its present status as real-time experience" (Pruchnic & Lacey, 2011, pp. 478-479). For this reason, the app encourages multiple viewpoints, similar to data points, to comment on and discuss cultural encounters.

Collective memory can give participants a focus and make recalling these cultural encounters more goal-oriented, because "what makes recent memories hang together is not that they are contiguous in time: it is rather that they are part of a totality of thoughts common to a group, the group of people with whom we have a relation at this moment" (Halbwachs, 1992, p. 52). In the case of App Abroad, the goal for recall and for reviewing user-captured media is to constantly challenge national cultural identity heuristics and to build a cultural awareness that is bottom-up.

Another way the app facilitates dialogue about cultural encounters is through user-generated tags of media uploaded to the feed. These tags are used to create a taxonomy that can be interrogated and revised by users of the app throughout the duration of an experience. Such features can be of benefit to technical communicators who are trying to learn more about different cultural audiences because it shows memory is often socially constructed.

Tagging

Users of the study abroad app are part of an emergent community, and tagging cultural encounters is an important feature of the app. Peter Morville (2005) discusses tagging on Del.icio.us and explains how tags are a "seed for emergent community" (p. 137). Emergent communities that are digital often seem to involve an emerging knowledge-base and value system, as well. Such values are transformed by entering discussions of what makes for effective intercultural technical communication in a workplace or classroom.

To support these discussions, the app encourages tagging user-captured media to create talking points. These talking points begin a conversation instead of ending one. Even so, there are important challenges to this approach. User-generated tagging is nonlinear, which also contains an important critique of the practice: tags can rapidly become haphazard and difficult to synthesize. On the other hand, creating a taxonomy for the app would be near impossible at the beginning of an immersion because predicting, even generally, experiences abroad and cultural encounters could be difficult. At the end of an experience, users can develop a more stable taxonomy as part of reflecting on and drawing meaning from it.

The process works similarly to how researchers make sense of a dataset by creating and defining codes, revising these codes as more data is interpreted, and then working to find trends that answer a set of questions that inspired the project in the first place. The user-generated tags are like starter codes that must be refined through collecting more everyday encounters with unfamiliar cultural practices. Later, the tags can be used to build a more critical understanding of culture. Through such features, tools such as App Abroad, when used in research contexts such as the study abroad setting, offer technical communicators the benefit of tracking gains in intercultural competence.

Listening

Technical communication research continues to assert the importance of effective listening practices in the workplace. The field has long understood and discussed the importance of active listening, where a person repeats and summarizes what they have heard during a conversation to signify engagement and build goodwill. Recent discussions of listening have extended these ideas a step further by training communicators to listen empathetically and openly as a skill.

The goal of empathetic listening is to look more deeply into the intent and mindset of a person. Indi Young (2015) explains, "It is all too easy to make assumptions about what the speaker means. You have your own life experience and point of view that constantly influence the way you make sense of things" (p. 52). To be more present during conversations, Young (2015) recommends asking probing questions to help determine a person's reasoning, reactions to the conversation, and guiding principles or personal philosophies (pp. 55-56).

Empathetic listening is also closely related to rhetorical listening, which requires an element of self-reflection and discovery during conversation. "Rhetorical listening signifies a stance of openness that a person may choose to assume in relation to any person, text, or culture" (Ratcliffe, 2005, p. 17). The openness of rhetorical listening is useful for cross-cultural communication because "its purpose is to cultivate conscious identifications in ways that promote productive communication" (Ratcliffe, 2005, p. 25). As people use the study abroad app, they rhetorically listen to the cultural encounters documented with various media and also *listen* to their individual and collective reactions to these encounters. Their goal is to learn to practice rhetorical and empathetic listening as a way to develop a more bottom-up understanding of culture through analysis, self-reflection, and dialogue. For technical communicators, these approaches to listening are important because they are useful tools for supporting an ethnorelative mindset. They also can help enhance our understanding of culture and communication by listening to logic and viewpoints that diverge from our own.

Applications to Industry

To apply the ideas in this article to technical communication in industry contexts, individuals could consider the following strategies or practices, as they can help guide the design of effective communication products (for example, documentation or interfaces) for greater global audiences:

Suggested Practice 1: Find ways to encounter unfamiliar cultures through everyday, often overlooked experiences. Encountering unfamiliar cultures through everyday experiences affords technical communicators a viewpoint not frequently captured by national cultural identity heuristics, but one with excellent value. For instance, learning about sound levels in restaurants or even portion sizes of foods in other countries can help technical communicators understand context and more effectively design communication for the location where information will be accessed. When communicating information that could impact people's safety, for example, having a strong sense of context can certainly prove useful. Earlier in the article, I explain how Patricia Sullivan (2014) advocates for mundane encounters with users as a way to work forward to understand users. Mundane encounters can carry more cultural relevance than sometimes expected.

Suggested Practice 2: Employ cultural identity heuristics as a starting point, then challenge them with as much data as you can find. While national cultural identity heuristics can sometimes prove to pigeonhole users, they also point to national trends that can be more deeply investigated and refined through investigation. Heuristics, like personas, should be revised on an ongoing basis. Hunsinger (2006) argues for a more fluid understanding of cultural identity, and while heuristics are a useful starting point for beginning to understand unfamiliar cultures, they can quickly become inaccurate if they are treated as static or absolute truths.

Suggested Practice 3: Practice a variety of listening techniques to emphasize a more bottom-up understanding of users. By listening empathetically and rhetorically, the technical communicator can work to understand personal beliefs, viewpoints, and ideas, and how these concepts influence user interaction with an interface or with information. Indi Young (2015) provides excellent strategies for implementing empathetic listening in the workplace and in user research. These practices can also help technical communicators reflect on their own cultural viewpoints and how they influence communication design as well.

Suggested Practice 4: Work to understand how your cultural values and beliefs influence your perception of

others'. One of the main functions of App Abroad is to emphasize the importance of collective and individual reflection. Even though cultural values and beliefs about technology vary, technical communicators can critically analyze intercultural communication design by reflecting on the influence of their own cultural beliefs and values on their work. Look to your own practices, tendencies, and habits as evidence of your personal cultural identity and note how they deviate from heuristics that are meant to represent your national culture. Such small insights can lead to better communication outcomes.

Through small changes in daily behavior, individuals can enhance their cultural competence by raising their awareness of the kinds of factors to consider when creating materials for individuals from other cultures. While the steps here are by no means definitive, they are a starting point that can help technical communicators shift how they think about culture and communication in ways that could enhance how they conceive of users from other cultures.

Conclusion

In terms of addressing the gap between a person and their national cultural identity, technologies such as App Abroad position user-captured media as a natural way to help people closely analyze cultural encounters and practices from the bottom-up. That said, there is no single way to develop a neat heuristic for understanding the needs, behaviors, and values of a person or group of people. Documenting and reflecting on everyday, mundane encounters with a culture has the opportunity to help people take a more critical stance and challenge national cultural identity heuristics, particularly when these encounters are interrogated and discussed in ethical, goal-oriented ways. As technologies such as App Abroad are further developed and beta tested during study and work abroad experiences, individuals can work to refine the tagging system to emphasize immersion through collective recall, tagging, and listening through goal-oriented dialogue and reflection to facilitate gains in cultural competence.

With these ideas in mind, technical communicators must seize opportunities for discussing culture collectively to formulate rival interpretations of user behavior. To have these conversations, teams can exchange ideas about customers by accessing media that they believe contains important information about users' cultural practices, and compare this data against national cultural identity heuristics. Additionally, technical communicators must continue to find methods of challenging national cultural identity heuristics when designing intercultural communication. To do so, technical communicators can similarly draw from commonplace encounters with different cultures, collect data from these encounters, continue to solicit feedback from users through research, and create a dialogue about cultural practices across a team. By developing a sense that culture and use is not static but constantly transforming, technical communicators can challenge traditional uses of national identity heuristics for a more bottom-up understanding of culture, and design more effective intercultural communication.

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Translation as a User-Localization Practice

By Laura Gonzales and Rebecca Zantjer

Abstract:

Purpose: This article presents translation as a user-localized activity. Using Sun's (2012) distinction between user and practitioner localization, the researchers present a preliminary illustration of how translation is enacted by multilingual participants aiming to translate words from their heritage languages into English.

Method: As part of this pilot study, ten, ten-minute interviews were conducted, video-recorded, and coded to better understand how multilingual users adapt information from their heritage languages into English.

Results: Results suggest that users employ several strategies when translating in context: acting, comparing/contrasting, deconstructing, gesturing, intonation, negotiating, sketching, and storytelling. These strategies involve the use of both words and other semiotic resources (for example, gestures, intonation) to convey meaning across languages.

Conclusion: Technical communication researchers and practitioners could develop more effective translation and localization frameworks by learning from the user-localized translation practices of multilinguals. Analyzing the translation practices of multilinguals who are not professional translators or interpreters could provide a framework for technical communicators to better recognize the complexities of writing in English for international audiences.

Key words: translation, localization, user-experience

Practitioner's Takeaway

- An introduction to the concept of culturally localized translation and how it, as a process, operates
- An overview of alternative methods of working with translators to produce materials for audiences from various cultures
- An overview of alternative approaches to more conventional methods of replacement and substitution when translating materials.

Translation as a User-Localization Practice

Introduction

Increasingly, technical communication researchers and practitioners are acknowledging the need to create culturally sensitive, global ready content (Agboka, 2013; Sun, 2012). As Maylath *et al*. (2013) explain, "diversity, interdependence, ambiguity, and flux epitomize the conditions under which international professional communicators work today" (p. 68). To produce and disseminate "culture-specific information models" that address the needs and skills of global users, "best practices are needed...that stem from collaborative research on culture, translation and localization, global audience analysis, and content strategy" (Batova & Clark, 2015, pg. 5). As others have noted, the importance of cross-cultural, multilingual communication has become increasingly integral to technical communication research and practice.

Numerous researchers in technical communication are developing contemporary models for understanding the importance of culturally localizing content (Batova & Clark, 2015; Maylath et al., 2014; St. Amant, 2002; Sun, 2006; 2012). Drawing on several case studies conducted to examine the function of mobile text-messaging in China, Sun (2012) highlights the role that local users' adaptations of a technology (that is, text-messaging) can be useful in improving developer localization. User localization, Sun (2012) argues, differs from developer localization, or "the localization work occurring at the developer's site that we commonly refer to when thinking of localization" (p. 40). User-localization focuses on the specific activities and strategies users employ when communicating to meet their culturally-situated needs. Understanding user-localization, in turn, can help developers design and adapt technologies to meet the needs of users in localized contexts.

In this entry, we examine how translation and localization are enacted through what Sun (2012) calls "user localization." By tracing the process of translation and localization as activities enacted by users in context, we aim to better understand translation and localization as culturalized activities (that is, activities that draw on users' cultural backgrounds and lived experiences). By better understanding what translation looks like when enacted by multilingual speakers (who are experts in multiple languages but not professional translators or interpreters), we believe that we can devise strategies and models for translation that are useful for technical communicators working across languages and cultures. Our goals are to

- Present a research-driven picture of what translation looks like
- Help technical communication researchers and practitioners identify places where we can learn from the rhetorical strategies of multilinguals to more effectively adapt information in international contexts.

Through approaching translation in this way, technical communicators can gain both an enhanced understanding of the expectations of audiences from various cultures and re-think how they might work with translators in the future.

Defining Translation and Localization

(Re)Defining Translation

Recently, many scholars have drawn a distinction and emphasized the connections between translation and localization (Batova & Clark, 2015; Sun, 2012). Translation, as Batova and Clark (2015) explain, often involves the replacement of one word in one language with a similar word in another language, an "attempt to duplicate meaning interlingually" (p.223). Many early uses of translation functioned under the assumption that simply replacing one word in one language with a word in another language would adapt content to meet the needs of international users (Bokor, 2011). However, as Jarvis & Bokor (2011) point out, language alone does not always produce a clear representation of a single thought or idea. Rather, it often conveys how we think about different kinds of experiences. Therefore, the simple one-to-one replacement of words from one language to another language may not account for cultural distinctions negotiated as ideas shift and move between people (p. 222).

From Translation to Localization

The perception of translation as a word-for-word replacement process has been countered by technical communicators for some time (Batova & Clark, 2015; Sun 2006, 2012; Walton, Zraly, & Mugengana, 2015). Batova and Clark (2015), for example, describe localization – the process of adapting content for a specific culture – as an alternative to the one-to-one translation process. Localization aims to address linguistic and cultural expectations of specific cultures in specific contexts (Batova & Clark, 2015).

Hence, localization accounts for not only the replacement of words, but also adapting materials to convey overall meaning from one culture to another. For example, conventional perceptions of translation might involve revising the text of a website to convey the same ideas in a different language. Localization, by contrast, would involve not only the translation of a website's text, but also the potential re-design of the sight to best address the expectations and usage patterns of individuals from another culture.

For the purposes of this paper, we will be using the term "translation" to refer to how individuals who speak more than one language convey the meaning of specific words across languages. That is, while we are using "translation" to mean the attempt to replicate the meaning of a word from one language to another language, we are also accounting for the ways users contextualize words from their heritage[1] languages into English. This process of language contextualization is common in the practices of trained translators. However, we also found that when individuals who speak English as a second or third language attempt to convey concepts from their heritage language in English, they do more than replace one word for another.

Multilinguals also provide descriptions of how these words are used in context across cultures. For example, if a person who speaks English as a second language wants to describe a practice or idea from his or her heritage language in English, she or he might tell stories about how that word is used in context. In so doing, that person might use gestures and voice intonation to describe how this practice or idea can be understood in English. In this way, analyzing the translation practices of multilinguals who are not trained translators or interpreters can provide technical communicators with additional knowledge about the connections between translation and localization. While technical communicators largely understand the importance of translation and localization (Agboka, 2013; Sun, 2006, 2012; Walton, Zraly, & Mugengana, 2015), recent work has also acknowledged the continued need to develop best practices and strategies for effective translation across linguistic and cultural contexts (Bokor, 2011, p. 210).

Toward User-Localized Translation

To better understand how technical communicators can continue developing successful models for translating and localizing content across languages and cultures, we designed a pilot study to examine how multilinguals engage in translation through user-localization. Because multilinguals are fluent speakers of more than one language, they are often accustomed to translating and localizing knowledge across languages and cultures (Agboka, 2013; Sun, 2012). Multilinguals in the U.S., even without professional translation training, are in the practice of making sense across languages as they translate information from English into their heritage languages (and vice versa) in their daily interactions. For this reason, we believe multilinguals hold expertise that can inform how technical communicators think about and approach translation and localization practices.

In our pilot study, we sought to answer the following research question:

> *What rhetorical strategies do multilinguals use to adapt information from one language to another?*

We chose to conduct a pilot study to address this question because we wanted to quickly assess the validity of our assumptions of what translation looks like as it is enacted by multilinguals. A pilot study approach was also useful because we wanted to build a sample set of data by which we could develop preliminary analytical and conceptual tools that could be used (by ourselves and others) in future research. Finally, by beginning to understand how experts in multilingual, cross-cultural communication adapt information across languages, we hoped to identify strategies technical communicators could use to interact more effectively with translators and localizers to generate materials for audiences from various cultures.

Method

To help us understand how translation and localization are enacted by multilinguals in practice, we conducted IRB-approved, video-recorded interviews (lasting approximately ten minutes each) with ten multilingual students at a Michigan State University (MSU). While the multilingual participants were all students during the time of the interviews, they came from various professional and cultural backgrounds, as shown in Table 1.

Participant Recruitment and Population Sampling

Participants were contacted through the international studies listserv at their university campus. All members

1 Drawing from the work of Torrez (2013), we use the term "heritage" language instead of "native" or "first" language to reference the language our participants identified as most significant in their linguistic development. The term heritage language aims to credit the cultural context of linguistic development.

Table 1. Linguistic and professional backgrounds of participants

Participant #	Participant Name	Participant Home Country	Participant Heritage Language
1	Damila	Mexico	Spanish
2	Abal	Ethiopia	Amharic
3	Bianca	Bolivia	Spanish
4	Nathalia	Colombia	Spanish
5	Huang	China	Mandarin
6	Maria	Philippines	Tagalog
7	Lilian	Syria	Arabic
8	Sarah	France	French
9	Kei	Japan	Japanese
10	Nadia	Costa Rica	Spanish

of the listserv were contacted via e-mail and invited to participate in interviews associated with this research project. Many of the participants who agreed to be interviewed for this project attended college and worked in their home countries before returning to the U.S. for graduate school. All participants spoke English with enough fluency to complete college-level coursework and were self-reported fluent speakers of English. Additionally, these participants represented eight different home countries (for example, Bolivia, Colombia, Syria, Ethiopia, Japan, China, Mexico, Costa Rica, France, and the Philippines) and eight different heritage languages (for example, Spanish, French, Arabic, Mandarin, Japanese, Amharic, and Tagalog). All participants spoke English as a second or third language, and three of them spoke an additional language aside from English and their heritage language.

Interview Protocol and Sample Questions

Each participant agreed to participate in a ten-minute interview in which the interviewee was asked to identify what they would consider as their first or heritage language. Next, interviewees were presented with a series of open-ended questions about their heritage language and translation practices (see a copy of all interview questions in Appendix A). Specifically, participants were asked "Can you describe a word in your heritage language that is difficult to translate into English? What is the word and what does it mean?" To collect data from these interviews, each session was video recorded and the related recording was later analyzed to look for patterns in individuals' translation practices.

The overarching objective of this pilot study was to better understand how participants re-create meaning from their heritage languages when they translate concepts into English. (These words came from Sanders' (2014) discussion of "11 Untranslatable Words from Other Cultures.") We asked interviewees to describe a word that they felt did not have an easy one-to-one replacement into English (that is, no one word in English was a direct match to the meaning of a corresponding word in the participant's heritage language). Because none of the words participants selected had an easy one-to-one translation available in English, we were interested in how participants used stories and/or made comparisons to describe terms from their heritage languages in English.

Although participants were aware they would be asked to translate "untranslatable" words in the interview, they were not given a list of words for translation or a detailed script of how the process would take place beforehand. This was because the goal of our research was to capture translation moments as they naturally unfolded, so we wanted to prevent participants from giving rehearsed definitions. As participants attempted to describe the meaning of the words they selected in their heritage languages, they employed several strategies captured on video recordings. These recordings were then analyzed to identify the strategies multilinguals used when translating and localizing information (that is, specific words) from their heritage languages into English.

Analysis

Video recordings of each interview were analyzed using Nvivo. Nvivo is a software program that allows researchers to code video data under various categories. During the analysis phase of the research, we watched and coded all the videos individually, using each sentence uttered by participants as an initial unit of analysis. During this coding process, we first listened to and watched each sentence uttered by participants during their interviews, and then noted a description of the types of strategies (for example, gesturing, storytelling) participants were using to describe words – specifically, words that did not have a one-word-to-one-word correspondent in English – from their heritage languages in English. While we did not start by looking for any specific translation strategies, we paused the

video after every sentence to write descriptions of the strategies we saw participants using to translate in that unit. For example, if a participant used her hands during a sentence, we would write "gesture" as an initial code for that unit. If she began to tell a story in a sentence, wrote "storytelling" starting with that unit, until the story concluded. Each of us initially completed this process for all ten videos used in this study.

After coding individually, we compared our initial descriptions (for example, "hand gestures") and developed new coding categories together to represent the triangulated coding scheme. For example, we replaced our initial description of "hand gestures" to the coding category "gesturing," which we describe in Table 2 as "moments where multilinguals use abstract physical movements to convey meaning and/or support a verbal explanation of a word." We created all coding categories together, drawing only from what we saw and heard as we coded the video interviews individually.

After developing the revised coding categories illustrated in Table 2, we re-coded the videos together. During this process, we watched each video together on one computer, pausing after each sentence the participants uttered to note the coding categories from Table 2 that applied during that unit of analysis. We then tabulated all code frequencies as illustrated in Table 2.

As illustrated in Table 2, the translation patterns we identified coding participants' video-recorded interviews account for much more than individual word-to-word translation. Instead, our codes account for the ways users localize information as they try to convey meaning from one language to another. Such processes, we found, involve more than just words. Rather, they are undertakings in which the individual uses body language, intonation, and other non-verbal resources to try to convey meaning. In this way, we analyzed how participants "organize, dramatize, reflect upon, and understand" language through their non-verbal communication as well as their verbal utterances (Sauer, 2003, p. 257).

Results

The video interviews resulted in a total of 140:11 minutes of coded video footage (roughly 14 minutes per interviewee). Results illustrate that participants spent a total of 69:43 minutes (roughly 7 minutes per interviewee) in what we describe as "translation moments," or instances when participants were translating and localizing language using the strategies coded in Table 2.

As Table 3 illustrates, the strategy yielding the longest duration within translation moments was storytelling (that is, where multilinguals use narratives -- both real and fictional -- to convey meaning). Storytelling was a behavior displayed by all participants at some point during their interview, and it happened a total of 36 times and occupied of 21:46 minutes of video footage across all participants.

While the translation strategies we describe in Table 2 were employed to some degree by multiple participants (with only one strategy -- sketching-- only employed by one participant), our analysis suggests individual participants combined and further localized these strategies to meet their individual translation goals during their interviews.

As Table 3 demonstrates, all participants used more than one strategy to describe words from their heritage languages into English, with the frequency of each code ranging from 1 to 36 occurrences for all participants. Each strategy listed in Table 3 also lasted from a range of 21-130 seconds on average for each participant.

In the following sections, we outline three individual participants' "translation moments" in an effort to further contextualize how translation is a user-localized practice. Through these examples, we aim to illustrate how participants layer translation strategies to convey meaning across languages.

Case Study 1 Sarah: Telling Stories to Contextualize Meaning

"Sarah's" first language is a Parisian dialect of French. During her interview (which lasted approximately 30 minutes), Sarah translated four words from French into English. During these translation moments, Sarah relied primarily on storytelling— in combination with other strategies such as intonation and gesturing— to convey meaning to her audience. Moreover, storytelling accounted for 5:50 minutes of Sarah's translation practices and occurred 9 distinct times throughout her interview. Sarah used storytelling to translate all four of the "difficult to translate" words from French into English.

The first time Sarah used storytelling was to describe *affriolant*, a French adjective that is used to describe a person who is a classy form of sexy (as opposed to non-classy or raunchy forms of sexy). After offering a preliminary definition of *affriolant,* Sarah moved into

Table 2. Coding scheme

Code	Description	Example
Acting	We coded as acting moments where multilinguals use literal physical movements to convey meaning.	A participant from Mexico rolled her eyes back and forth to help audiences understand enjache, a Spanish term for an eye movement used to express dissatisfaction with someone.
Comparing/ Contrasting	We coded as comparing/contrasting moments where multilinguals use a word that is known to the audience as the starting point for their translation. Multilinguals compare by building on the similarities between the known and unknown word. Multilinguals contrast by building on the differences between the known and unknown word.	A participant from France explained dépaysement, the feeling of being in a completely foreign environment, by explaining how it was different from "homesickness," the nearest direct English equivalent.
Deconstructing	We coded as deconstructing moments where multilinguals explain a word by breaking it down into its component parts.	A participant from Syria explained a compound word, wabi sabi, by explaining wabi and sabi individually and how those words worked together to form wabi sabi.
Gesturing	We coded as gesturing moments where multilinguals use abstract physical movements to convey meaning and/or support a verbal explanation of a word.	A participant from Costa Rica explained bochinche, or a place/event that is oppressively noisy, by waving her arms and covering her ears to convey how it feels to be in a bochinche.
Intonation	We coded as intonation moments where multilinguals use vocal inflection (for example, raising/lowering pitch, altering tone, etc.) to convey meaning.	A participant from the Philippines explained gigl, the feeling you get when you see something so cute you want to shake it, by raising his vocal pitch and emphasizing "oo" sounds.
Negotiating	We coded as negotiating moments where multilinguals explain words by putting them in relationship with one or more related terms.	A participant from France explained mitonner, or the act of making a very detailed/time-consuming meal, by relating it to other French words for cooking and explaining where the meanings overlapped and diverged.
Sketching	We coded as sketching moments where multilinguals use visual aids to convey meaning.	A participant from Japan explained komorebi, or the effect of sunlight streaming through trees, by pulling up a digital image that he felt captured komorebi.
Storytelling	We coded as storytelling moments where multilinguals use narratives (both real and fictional) to convey meaning.	A participant from Ethiopia explained gursha, or the act of placing food in someone else's mouth, by telling a story about going to a restaurant with a friend and giving each other gurshas.

describing the type of person who would be characterized as *affriolant.* Sarah was not asked to further describe the term she was translating; however, she offered the following description of *affriolant* on her own:

> *She is a woman who is noticeable, she is very feminine—maybe almost a bit too much, she attracts the eyes.*

Throughout her story, Sarah incorporated gesturing and intonation strategies to impersonate an *affriolant* woman.

Another time Sarah used storytelling occurred when she described *ballot,* a word that has two connotative (that is, socially based) meanings. To explain the differences between these two meanings, Sarah tells two stories back-to-back. The first was used to explain what *ballot* means when referring to a situation. A *ballot* situation, roughly translated, is an event that was going well until one disastrous moment.. Sarah explained a *ballot* situation via this following story:

Table 3. Frequency of codes

Code	Frequency (n)	Avg. % of Translation Practice	Total Duration (secs.)	Number of Participants Displaying this strategy	Heritage languages of participants displaying this strategy	Avg. duration (secs.) of this strategy per participant
Acting	9	5.10%	335	4	Spanish, French	84
Comparing/ Contrasting	14	4.35%	413	5	French, Japanese, Spanish, Arabic	82
Deconstructing	6	3.78%	263	3	Arabic, Tagalog, Amharic	88
Gesturing	22	4.06%	669	8	Spanish, French, Japanese, Amharic, Tagalog, Arabic,	83
Intonation	27	4.60%	903	9	Tagalog, Spanish, Arabic, Mandarin, Amharic, Tagalog, Arabic, Japanese	100
Negotiating	8	1.88%	273	4	French, Arabic, Mandarin, Japanese	68
Sketching	1	1.17%	21	1	Japanese	21
Storytelling	36	4.88%	1,307	10	Spanish, French, Arabic, Mandarin, Japanese, Amharic, Tagalog	130

> *You and all your friends are so excited, you're going to go to this party and everybody is ready and you're about to get in the car and you go to start the car and there's no gas. And then you'll be like, 'Ohh, [French words] ballot. This sucks.*

When Sarah reached the point of her story where she talks about running out of gas, she used a shrugging gesture to emphasize the future futility of the situation and the "Oh, well" feeling a *ballot* situation creates.

However, the meaning of *ballot* changes when it refers to a person. Thus, immediately following her story about a *ballot* situation, Sarah tells a story to describe a *ballot* person. Sarah's story carries on the party metaphor and talks about how a *ballot* person is good-natured, but always makes clumsy mistakes that ruin the party. Again, Sarah's story is combined with intonation and facial gestures to convey the feeling a person may have toward a *ballot* individual.

Figure 1 demonstrates Sarah's facial expressions and gestures during storytelling for translation. The first image captures the gestures Sarah used when telling the story of an *affriolant* woman, the second captures her gestures for describing a *ballot* situation, and the third captures her facial expressions during her story of a *ballot* person.

What Sarah's use of a storytelling strategy shows is that translation— as it is localized by multilinguals — is about more than word replacement. For every word Sarah translated, she accompanied her descriptions of the word with stories. This process illustrates how Sarah sees meaning as embodied in specific contexts of use. In essence, Sarah draws from her experiences as a dual member of French-American society more than her knowledge of vocabulary to provide definitions as word pictures. Sarah's focus in these translation moments is more centered on conveying the emotional experience of *affriolant* and *ballot* than on providing adequate one-to-one replacement words in English. In so doing, Sarah is localizing the ideas of *affriolant* and *ballot* to her English-speaking audience through the narration of contextual experiences.

Translation as a User-Localization Practice

Figure 1. Sarah tells stories accompanied by facial/body expressions to contextualize translations.

Case Study 2 Damila: Combining Strategies to Localize Translation

"Damila" is from Mexico, and her heritage language is Spanish. During her interview, Damila was asked to translate the Spanish phrase *sobre mesa,* which translates to English as "above the table." When describing *sobre mesa*, Damila first provided a literal translation of the phrase *sobre mesa* by explaining that the phrase means "above the table." However, without being prompted, Damila further explained that this literal translation of the phrase in her heritage language is not accurate. Instead, Damila localized *sobre mesa* by employing several coding strategies simultaneously: comparing, gesturing, and intonation-inflection. During her 10-minute interview, Damila spent 8:32 minutes translating *sobre mesa* by combining strategies.

Damila started to elaborate on the literal translation of *sobre mesa* by comparing the phrase to common dining practices in the United States. She explained,

> *We have a word to use after you finish eating lunch or dinner. If you stay at the table after having the meal we call it sobre mesa. Probably we use it because, for example here you eat lunch and that's it. In Mexico is like ok the dessert, the coffee, and we added a word for that which is sobre mesa.*

Damila compared the phrase *sobre mesa* to common dining practices in the United States by saying, "for example here you eat lunch and that's it…" As she spoke, Damila began to make circular gestures with her hands to indicate the extended dining process that takes place in Mexico as people have "the dessert, the coffee" and so on.

As Figure 2 illustrates, Damila combined her comparison of dining practices with her use of gestures, illustrating just how extended the practice of *sobre mesa* is for her family in Mexico. Her gestures suggest the dining experience in Mexico can often "go on and on," which is how the phrase *sobre mesa* emerged.

Figure 2. Camila gestures the extended dining practice of "sobre mesa."

In addition to defining the phrase *sobre mesa* through a combination of gestures and comparisons, Damila further localized the phrase by explaining that the term is only used in certain parts of Mexico. When the interviewer asked, "So there are particular phrases only used in certain parts of Mexico?" Damila elaborated by explaining that the language practices in Mexico are very closely tied to geographic regions. She explained

> *In Mexico, if you go to the north, center, or south, we can very easily notice where you're from since we sing sometimes when we're talking.*

Damila went on to explain the different ways the phrase *sobre mesa* could be said in various parts of Mexico. She used tone inflections to signify how speakers from different regions of Mexico would utter the same phrase. At the same time, Damila also used her hands to visually indicate the differences between these phrasings, explaining that some speakers may cut their words short while others may elongate their

vowels. Figure 3 illustrates the gestures Damila used in combination with her tone inflections to describe how speakers from various parts of Mexico may use and pronounce the phrase *sobre mesa*.

Figure 3. Damila uses gestures and tone Inflections to translate "sobre mesa."

As Damila's discussion of *sobre mesa* suggests, when users localize translation practices to meet their needs, they often employ several translation strategies simultaneously. For Damila, simply translating *sobre mesa* to "above the table" would not encapsulate the cultural implications embedded in the phrase as it is used in Mexico. Furthermore, as Damila illustrated, conveying meaning across languages often requires attention to semiotic resources like tone and body language.

Case Study 3 Kei: Sequencing Translation Strategies Based on Audience Response

"Kei" who identified his heritage language as Japanese, attempted to translate the term *komorebi,* a Japanese word that (roughly) means the interplay between light and leaves when sunlight streams through trees. Kei's translation time for this word had a duration of two minutes and 24 seconds. He translated a total of 3 words during his 12-minute interview, and in doing so, he used sequenced translation strategies (gestures, sketching, and deconstructing) for his translation events. Additionally, Kei used gestures and sketching (that is, physical movements and drawings) for all three translation events, but he only used deconstructing (that is, breaking down a word into all its components and parts) to translate *komorebi.*

During Kei's translation event, he employed three unique strategies in sequence to provide alternative, more nuanced explanations of *komorebi.* What is interesting about Kei's translation strategies is that instead of using layered strategies (that is, using multiple strategies at once), Kei used sequenced strategies. That is, Kei would rely on one strategy at a time to translate *komorebi* to an English-speaking audience.

First, Kei used gestures when trying to translate the term. He noted, "*Komorebi* means sunlight streaming through trees" while using his right hand to imitate sunlight (for example, spreads his fingers apart with palm downward and arm over his shoulder) and how the light disperses through trees (for example, moving his hand back and forth at shoulder level while still making the sun gesture). Kei then moved from gesturing to sketching. Using a tablet computer he had brought with him, Kei pulled up a picture that he felt illustrated *komorebi* and then turned the tablet toward his audience while saying "This, this sunbeam is *komorebi*" and pointing at a beam of light shining through trees with his right index finger.

After the interviewer voiced some confusion about her understanding of *komorebi*, Kei adopted a third strategy— deconstructing —to translate *komorebi.* Kei split the word into its three component parts— tree, leaking, and sunlight — and then explained the definition again using these component words. During deconstruction, Kei also used gestures to number off the component parts (that is, holding up one finger for the first component part, two fingers for the second, and three for the third). Based on positive feedback from the interviewer ("That makes perfect sense!"), Kei ended his translation moment. Figure 4 shows screen captures of Kei's three translation strategies. The first two illustrate his gesturing moves, the third his sketching moves, and the fourth his deconstruction moves.

Figure 4. Kei uses sequenced strategies to translate responsively.

What's interesting about Kei's translation practices is not only the various strategies he leveraged to communicate with his audience, but also the way he sequenced physical, visual, and logical descriptions of *komorebi* based on explicit and perceived feedback from his audience. Kei began with a physical description, enacting *komorebi* through gestures. While he was completing these gestures, he made eye contact with the interviewer, trying to determine via her facial reactions if the meaning of *komorebi* was clear. Feeling dissatisfied with her response, Kei switched to a visual description and used an image on his tablet computer to enhance his description. Although the interviewer reacted positively to Kei's visual description, a question she asked reflected a less-than-complete understanding of *komorebi.* Therefore, Kei moved into his logical description of *komorebi.* Kei's translation event only ended after the interviewer gave explicit feedback that she understood Kei's explanation.

It's interesting to note that while Kei used gesturing and sketching to define all three terms he translated during his interview, the interviewer's confusion led him to employ a third strategy (deconstructing) to describe *komorebi.* In fact, as evidenced in Table 3, deconstructing is the only strategy exclusively used by a single participant. This factor perhaps suggests that multilinguals resort to new and different translation strategies based on feedback from their audience.

Because the interviewer did not experience confusion during other interviews, perhaps it was this confusion that led to the use of a new and unique translation strategy (deconstructing). While this argument would certainly need further analysis, it was interesting to see how the translation strategy of deconstructing emerged from the interviewer's confusion during a translation moment. Kei's adaptation and implementation of deconstruction is a purposeful rhetorical strategy used to further localize a word from Japanese into English.

Kei's interplay with the interviewer and his adjustment of translation strategies based on audience feedback classifies his translation work as rhetorical practice. Whereas contemporary discussions of translation typically position translation communication as non-rhetorical, Kei's production of iterative translation strategies based on audience awareness is a rhetorical act of invention (which we define as the discovery of arguments). Kei's invention is happening on-the-fly as he processes verbal and nonverbal cues of (mis)understanding from his interviewer. This demonstrates the intellectual labor of translation work and the way a single translation can be conveyed rhetorically via different strategies for different purposes.

Discussion

Our analysis of users' localized translation practices suggests there are several elements to translation that are not always accounted for when technical communicators think about translating materials to convey information to audiences from various cultures.

First, our research demonstrates user localization of translation practices are accomplished via multiple, layered, and sequenced strategies. While some of these strategies— like storytelling and gesturing — are not necessarily new, the purposeful, rhetorical use and layering of these strategies (as illustrated through our case studies) exemplify the complex negotiation of history, culture, and language that takes place as users translate words and phrases into English. This intellectual complexity and rhetorical implication is often not recognized in current discussions of translation in technical communication, where the tendency is to think in terms of word-to-word replacement. In this model, all of the credited intellectual labor is done by the individual(s) writing the original language version and the translators of the content are positioned as mere processing agents (which, in the case of machine translation, is quite literal). Our research suggests that technical communicators need to re-consider how they conceptualize translation work and, by extension, the people who do that work.

Second, our research demonstrates user localized translation is a sequenced, scaffolded response to audiences. For the participants we interviewed, the translation and localization strategies employed largely relied on the reaction participants were receiving from their audience (that is, the interviewer). If the interviewer confirmed a definition provided by the participant, the participant might elaborate through a new story or example to further develop meaning. If the interviewer incorrectly described the term being translated by the participant, however, that participant would choose to layer, sketch, or act out the term further. In this way, multilinguals exhibited a nuanced rhetorical dexterity as they adjusted their translation strategies to meet the needs of their audience at a specific time. Popular discussions of translation in technical

communication sometimes present translation as a "one-and-done" event (that is, a quick replacement of words), one that often occurs at the end of a writing/design project. Our research challenges this perception and argues that culturally-sensitive, global-ready translated content needs to be iterative, sequenced, and responsive to effectively localize meaning across languages.

Additionally, our research positions translation as an experience-centric event. Participants in our study drew upon their own experiences and cultural knowledge to localize translations in context. Sarah, Damila, and Kei called upon a wide array of experiences to transform the meaning of words from their first languages into English. By explaining words in their contexts of use, participants revealed the benefits of cultural knowledge to the translation process and the usefulness of story to illuminate meaning. This finding stands in contrast to one-to-one input/output models of translation that are focused on pragmatic goals of efficiency and accuracy. Thus, our analysis argues for an experiential— instead of merely utilitarian — perspective on translation.

As technical communicators and practitioners working toward creating user-centered global content, it's important that we consider not only the words we are transforming through localization, but also the experiences, stories, and histories we are referencing and recreating as we move information across languages. Technical communicators creating content in English for international audiences could consider further researching and implementing contextualized uses of language (such as stories) in international content.

Applications of Research

Drawing from our analysis of translation as a user-localization practice, we offer the following suggestions and implications for technical communicators working in increasingly global contexts:

- *Individuals who translate content work as builders and contributors of knowledge, not as simple replacement agents.* Our preliminary study suggests translation is difficult intellectual work that requires significant adaptation and recontextualization of culturalized knowledge. As Walton, Zraly, and Mugengana (2015) also explain, "translators always shape data in cross-language research," and must be acknowledged as active participants in technical communication research and practice. We also make an argument for the value of multilinguals who are not professional translators or interpreters in cross-cultural research, as these individuals have learned translation strategies in practice that can be useful to researchers, designers, developers, and technical communicators.

- *When planning a project, technical communication researchers and practitioners should plan for iterative and responsive translation versioning instead of a "one-and-done" translation*. As illustrated through Kei's responsive translation based on feedback from the interviewer, accurate translation often requires the implementation of inventive, responsive translation strategies developed in the moment of translation. For this reason, translation should be a practice situated within the development stages of any product or document intended for multilingual audiences, thus allowing for audience response and feedback.

- *Technical communicators and information architects could benefit from conducting usability tests with translated, as well as first language, versions of a product/site.* All of our participants demonstrated intricate, multi-layered understandings of words in their heritage languages. Often, simple literal translations did not adequately account for the ways language is culturalized and used by multilingual participants (see, for example, Damila's discussion of *sobre mesa*). For this reason, it's important to conduct usability tests during and after the translation process for any system or document to both account for and value the culturalized linguistic knowledge and needs of international users.

- *Multilingual participants can teach us how to translate rhetorically.* As evidenced in the layered, rhetorical translation strategies exhibited by our participants, multilinguals have expertise in adapting knowledge and information across languages and cultures. Often, individuals who speak English as a second or third language are positioned as inferior in U.S. academic and professional settings. Our findings suggest that these individuals, rather than taking deficit positions in these contexts, could be consulted as rhetorical experts who can transform knowledge to meet the needs of culturally diverse

audiences, even if these individuals do not have professional training in translation. Multilingual users reflect the increasingly diverse audiences of technical documents and technologies, and should therefore be acknowledged as expert participants in the development process.

Limitations

We strategically employed a pilot approach for this study to

- Validate deeper research assumptions
- Build preliminary research frameworks (for example, a coding tool) that can be used by us and other technical communication scholars for future inquiry

Due to the small number of participants represented in this study, the findings we present are preliminary and non-generalizable. However, while the number of participants represented is small, we attempted to include a broad range of languages in our sample, allowing us to see how translation is enacted by speakers from different cultures with different heritage languages.

While our preliminary findings are useful, more extensive studies could expand upon and test our initial findings with a larger group of individuals or with large sample groups in specific cultures and languages. For example, we noted some similarities in the translation strategies used by four Spanish-speaking participants, with all four participants using gesturing and storytelling to translate. However, since these four Spanish-speaking participants came from different countries and spoke different dialects of Spanish, we cannot make generalizations about the patterns exhibited in the translation practices of Spanish speakers. Future studies could more intricately trace if and how participants' heritage languages lead to any consistent patterns in translation strategies.

Future research in this area would also be useful in terms of identifying additional translation strategies that may not have been visible in this study and in tracing how those translation strategies evolve and interact over time. Specifically, we are already using the early analytical tools developed in this study to examine how a group of multilingual writers work to translate content over a period of time. In so doing, we hope to see how strategies are used by multilinguals situationally and how group dynamics impact translation practice.

Conclusion

Analyzing user-localized translation as an activity has helped us understand translation as a purposeful, intellectual process. Individuals who move across languages to communicate their ideas draw on a wide arrange of semiotic resources, and they layer and sequence these resources rhetorically to meet the needs of their audiences.

The main argument of this article is that translation work, much like early technical communication, is an under-theorized and under-rated intellectual practice within the field of technical communication — one that deserves more careful scrutiny by the technical communication community. To this end, we provide thick descriptions (that is, layered and culturally-situated illustrations) of translation in context to highlight the complexity of translation as intellectual work. We offer these descriptions to re-cast translation as a complex, intellectual activity.

This new framework for theorizing and enacting translation can prompt conversations about the role of human translators in technical communication work and/or how the design of machine translation tools can be improved by understanding what user localized translation looks like in context. Analyzing the translation practices of individuals who have heritage languages other than English helped us understand how technical communicators creating content in English for international audiences could expand their conceptions of translation to account for cultural context. Additionally, analyzing the translation practices of our participants helped us understand how translation work extends beyond the written and verbal; technical communicators creating content for international audiences could in turn continue making use of visuals and other semiotic resources to transform content across languages.

Finally, we suggest that further research is necessary to better understand how multilinguals can inform technical communication research, teaching, and practice. In this way, we can continue to develop "more research and teaching approaches that historicize technical communication's roles in hegemonic power relations" by pushing for methodologies that break from expert/non-expert dichotomies in multilingual content development and design (Scott, Longo, & Wills, 2006, p.1).

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Translation as a User-Localization Practice

Appendix A: Interview Questions

1. Can you tell us what you identify as your first or heritage language? What is the first language you learned to speak?

2. We asked you to join us today to talk about words in your heritage language that you think might be difficult to translate into English. Can you think of any words in your heritage language that can't be easily translated into English?

3. Can you choose one of the words you described in your answer to the previous question and try to translate this word into English? What is the word and what does it mean?

4. Why do you think this word is difficult to translate into English?

5. Can you choose another word from your answer to question 2 and attempt to translate it into English? What is the word and what does it mean?

6. Are there other words in your heritage language that you think might be difficult to translate into English? How would you attempt to translate these words?

Books Reviewed in This Issue

The Snowball Effect: Communication Techniques to Make You Unstoppable

Andy Bounds. 2013. West Sussex, United Kingdom: Capstone. [ISBN 978-0-857-08397-5. 282 pages, including index. US$22.00 (softcover).]

Bounds has a unique background that enables him to be an outstanding communicator and author. He attributes his mother's blindness to his lifetime of experience communicating from someone else's point of view. His book, *The Snowball Effect: Communication Techniques to Make You Unstoppable*, will get you writing more effectively in an hour.

Bounds suggests reading Section A, Build Your Core: The Cornerstone of Successful Communication, to establish the core of your snowball for effective communication. Then, you can read any chapter of interest or browse the table of contents for a particular topic of interest.

I personally found this approach very useful. I first tested the techniques mentioned when doing an agenda for a Booster club meeting. Our meeting was shorter because I presented the important facts as part of the agenda. For example, I wrote Summer Team as an item for discussion. Under that agenda item, I included action items: determine practice location (optional), determine who will coach, and salary. I emailed the agenda the day before. Then, at the meeting, we just needed to act on each point.

As part of building your core, Bounds says that because most people approach their email and presentations in a 1, 2, 3 … approach, it takes longer to reach the action required and people don't respond quickly. Therefore, he suggests a 2, 3, 1 approach by placing the "do" portion first. Bounds also suggests keeping content to a minimum. In addition, he points out that the e-mail subject line may not reflect that an action is required. In our department at Siemens if action is needed, we begin the e-mail's subject line with "Action required:" to let the recipient know they need to act.

Section B of *The Snowball Effect* contains information on getting more done quickly. Bounds teases the reader's interest by adding the subtitle, "How to save one month per year." Who wouldn't want to save a month? This section contains information for having better, quicker meetings; quickly creating presentations that work; and emptying your inbox. Take a quick look at your inbox. Want to empty it efficiently? In Chapter 13, Bounds walks you through his 5-D process to not only cleaning your inbox, but keeping it clean.

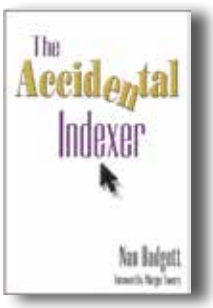
Other sections include topics on convincing others to do what you want, how to make work more fun, and how to remove your communication frustrations.

Once you begin building your snowball's core, you can gain additional momentum and tips by checking out Bounds' Web page (www.andybounds.com) and signing up for his free Tuesday tips that include such pieces as "A surprising fact – your best question is your SECOND one" and "How to run an impactful meeting."

Rhonda Lunemann
Rhonda Lunemann is a technical writer with Siemens PLM Software and a senior member of STC's Twin Cities Chapter.

The Accidental Indexer

Nan Badgett. 2015. Medford, NJ: Information Today, Inc. [ISBN 978-1-57387-514-1. 224 pages, including index. US$39.50 (softcover).]



The Accidental Indexer is a great all-in-one book covering the many facets of an indexing career and the profession as a whole. It's an easy and entertaining read, yet the book is packed with information for those considering an indexing career, beginning indexers, and more seasoned indexers alike.

Badgett begins by addressing just what indexing is and how one gets started doing it, including a suitability quiz for aspiring indexers. Everything needed to establish an indexing career is covered such as how to get training, starting a business, insurance and taxes, setting up an office, software and equipment, information resources, marketing, and working with clients. An appendix includes several sample business forms that readers can adapt to their own use.

Chapter 3 discusses the many types of indexing and gives an overview of indexing print books, periodicals, databases, ebooks and electronic documents, and Web sites. Badgett also describes the various segments of the book publishing industry that hire indexers. Another

quite helpful chapter is about achieving excellence, and describes, besides training, best practices and indexing award criteria. A corresponding appendix includes a concise list of quality indexing benchmarks, and guides to editing and evaluating an index.

Seasoned indexers will especially appreciate Chapter 8 regarding work/life balance, certainly one of the most challenging aspects of a freelance lifestyle. Badgett makes suggestions for efficient use of time, setting office hours, and creating home office boundaries. She also touches upon stress management, diet and exercise, and ergonomics with useful additional resources listed at the end of the chapter.

Also interesting for more experienced indexers is a chapter about creativity in indexing work. Topics covered are entrepreneurial indexing, creative collaboration, subcontracting, and creative communication. There is even a section on incarcerated indexers!

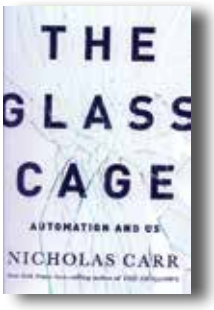
Badgett concludes *The Accidental Indexer* with advice to follow your inner indexer in making decisions about starting an indexing career and lays out the first steps in starting a business. This book is highly recommended to anyone interested in any aspect of the indexing profession.

Jennifer Spanier

Jennifer Spanier has been a freelance book and database indexer since 2009 and is an active member of the American Society for Indexing. Previously she has worked as a biologist and a public librarian and indexes in a wide variety of subject areas.

The Glass Cage: Automation and Us

Nicholas Carr. 2014. New York, NY: W.W. Norton & Company. [ISBN 978-0-393-24076-4. 276 pages, including index. US$24.95.]



Nicholas Carr argues that the increasing power of automation lulls us into believing that such systems are infallible and that their feedback is always the most accurate. Ceding our control to the machine, we lapse into complacency and "learned carelessness" (p. 71) that numbs our ability to solve problems when the automated system cannot.

As Carr shows, such "automation addiction" results in the operator's "deskilling," and can have serious, even catastrophic, consequences (pp. 58, 55). A prime example is the airline pilot who becomes overly dependent on automated flight controls and loses the ability to fly the plane based on practical experience or "know-how" (p. 74). In extreme cases, as in the 2009 Air France accident, the pilot may not know how to respond, with disastrous results.

Similarly, architects increase their efficiency by using "cut and paste" CAD designs, but their work becomes "banal, lazy and uneventful" (p. 147); travelers navigate more efficiently with GPS, but lose the spatial context and sense of orientation provided by paper maps; and doctors draw on immense statistical databases for diagnosis, but often miss less predictable signs of illness.

Automation is becoming "a system that discards us" (p. 198). We are essentially "disembodying ourselves" (p. 151), losing the "embodied cognition" necessary for a full human experience of the world (p. 149). To recover "embodied cognition," we must learn to work *with* rather than *for* tools so that the human retains final control, not the machine. This balanced approach "binds us to the earth," and nurtures our existential relationship to the world, but without losing the advantages of automation (p. 214).

One solution is to design "human centered automation" (p. 164) that requires explicit, conscious operator involvement as part of the overall system. Thus Boeing's new flight control systems compel conscious pilot involvement by mimicking traditional cable controls, keeping the pilot sensorily aware and in ultimate control of the plane's behavior at all times. In the same way, stylus-based CAD software preserves the architect's creativity by not immediately reformatting drawings according to predefined templates. In each case, the system does significant work, but the human remains continuously involved, responsive, and in control.

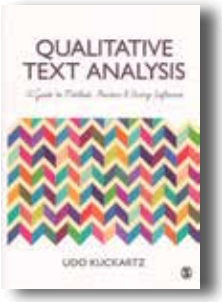
The Glass Cage: Automation and Us is well-documented, drawing upon classic academic studies such as Csikszentmihalyi's on "flow" and Yerkes-Dodson's on human performance, as well as recent work on the neurological mapping of spatial orientation and memory and Matthew Ebbatson's study of "'skill fade'" in pilots (p. 58), among others. Carr's book is also clearly written and highly readable, a notable achievement considering the technical and potentially very dry topic.

Automation is not going away, nor should it. As Carr convincingly argues, we must always give "people precedence over machines" (p. 228), lest we end up slaves to our own creations.

Donald R. Riccomini
Donald R. Riccomini is a member of STC and a lecturer in English at Santa Clara University, where he specializes in teaching engineering and technical communications. He previously spent twenty-three years in high technology as a technical writer, engineer, and manager in semiconductors, instrumentation, and server development.

Qualitative Text Analysis: A Guide to Methods, Practice & Using Software

Udo Kuckartz. 2014. Sage Publications Ltd. [ISBN 978-1-4462-6775-2. 174 pages, including index. US$48.00 (softcover).]



Among the extensive literature on qualitative data analysis, what distinguishes *Qualitative Text Analysis: A Guide to Methods, Practice & Using Software* is its concrete introduction to conducting qualitative data research. Realizing the challenges in the literature—imprecise descriptions of analysis process and diverse quality standards—Kuckartz strives for "methodical rigour" (p.11) to provide a systematic guide to qualitative data analysis and its implementation for beginners to qualitative research.

Using the example of guideline-structured interview texts, this book presents (1) theoretical underpinnings of qualitative text analysis (QTA), (2) basic concepts and the QTA process, (3) three principle QTA types, (4) QTA using computer-assisted methods, and (5) quality standards, research reports, and documentation.

Notably, *Qualitative Text Analysis* focuses only on category-based methods and analysis. In fact, working with codes and categories is central to the presented QTA theories and methods. It is important to differentiate between these category-based methods and sequential analysis methods (commonly used in discourse or narrative analysis).

QTA is built on the strengths of classical hermeneutics, grounded theory, and content analysis. It is a set of systematic rules for coding and creating categories based on all texts of the entire data, in which hermeneutic interpretation and reflection play a significant role; it also recognizes quality standards and aims for intercoder agreement.

Kuckartz describes three basic QTA methods in detail: thematic analysis, evaluative analysis, and type-building analysis. For each method, he elaborates the complete phases of analysis process, from working with the text, to building categories, to coding, to analyzing, to presenting results. Although many other guidebooks on qualitative research eliminate or briefly mention the last step, presentation of results, *Qualitative Text Analysis* considers it as an integral part and explicates seven types of presentation of results for each method. Kuckartz frequently uses lists, figures, and tables for illustrating key terms, steps, and rules. The example project, an interview about individual perception of climate change, which adopts all three methods for different research questions, also makes the description more comprehensible and practical. Special attention goes to the differences between individual and team researchers in coding and categorizing. Another important subject is how to use computer software to increase the quality of analysis. Kuckartz gives an overview of the assistance computer software can offer throughout the entire analysis process of the three methods mentioned above.

Overall, *Qualitative Text Analysis*'s step-by-step structure and hands-on application make it a great starting point for both individual and team researchers interested in qualitative data analysis. However, since the methods described are exclusively designed for the data type "text," one would need to modify the methods to analyze different types of qualitative data, such as images, movies, and other products of culture and communication.

Lin Dong
Lin Dong is a PhD candidate in Rhetoric and Composition in Georgia State University. She has broad research interests in cross-cultural and international rhetoric and communication, especially in technical and professional communication in the global contexts. Lin is currently preparing her PhD dissertation on international crisis communication from a sociotechnical aspect.

Designing News: Changing the World of Editorial Design and Information Graphics

Francesco Franchi. 2013. Berlin, Germany: Gestalten. [ISBN 978-3-89955-468-7. 240 pages. US$78.00.]

Is print dead? In *Designing News: Changing the World of Editorial Design and Information Graphics*, Franchi examines how the digital era is effecting editorial design. He looks at the issues that are causing newspapers to shut their doors after more than a hundred years of business. But why are some closing while others continue by restructuring and reformatting? And now with the Internet becoming a news source for a significant amount of our news, what can we learn from those that are successfully maintaining news sites and relaying information on various digital platforms? Franchi offers insights on how to handle the issues that challenge the very existence of newspapers in today's digital and technologically advancing world.

One problem with printed newspapers is that they cater to a select crowd. Your content must appeal to the buyer or you will not have a sale. Franchi says, "A printed newspaper is like a package. The reader who wants to read only about sports or only about the stock exchange has to buy the same newspaper as the reader who is interested only in politics, in recipes, or in horoscopes" (p. 21). With digital news platforms, readers can choose the articles and content that appeals to them. With these digital platforms and their problems, how do you get the reader to buy in? Some news sources are using a paywall, where some content is in front of the wall and available to anyone to access with the remaining content residing behind the wall that can only be accessed through purchase. The goal is to draw the reader in with quality content and leave them wanting more. The problem is the readers' attention span is lacking; many read one or two articles and then move on, bypassing the paywall.

Franchi shows that the power of design is the solution for these news sources to consider. Merely restyling the "look" of the paper is not enough to draw in the readers. *Designing News* shows us instead that design should be applied to the whole paper. Content and design go together; what the author refers to as "rethinking" is in fact the key. The abundance of information that is available must be made accessible to readers. This book argues that this can be done through careful design practices including well designed layout, well planned and quality content, information graphics, and through careful research and brand development; all are graphic designer talents.

Case studies of successful newspaper and news magazine redesigns throughout the text help illuminate the presented ideas. *Designing News* will appeal to anyone in editorial design, newspaper, magazine, and other formats. The issues that Franchi addresses bring to light a better understanding of the challenges that news sources struggle with and how to present their content. The solution to this struggle can be found in "questioning both the identity of the newspaper and its role in society" (p. 227).

Amanda Horton
Amanda Horton holds an MFA in Design and currently teaches graduate and undergraduate courses at the University of Central Oklahoma in the areas of design technology, design studio and history of graphic design. She serves as a book reviewer for *Technical Communication.*

Practical Empathy: For Collaborating and Creativity in Your Work

Indi Young. 2015. Brooklyn, NY: Rosenfeld Media. [ISBN 978-1-933820-48-4. 182 pages, including index. US$39.00 (softcover).]

When you think of empathy, you probably think of emotions and feelings. Young's *Practical Empathy: For Collaborating and Creativity in Your Work* argues that there is a second kind of empathy: Cognitive empathy where you determine another person's thought processes. The value of using cognitive empathy is that you can understand others better than when using statistics, especially people you work with, including customers. She describes a method for developing cognitive empathy so that it can become, as the title suggests, practical.

Young divides her book into three sections: the role of empathy (Chapters 1–3), developing empathy (4–5), and applying empathy (6–9). Starting with Chapter 4, Young adds a summary. Chapters 4 and 6–8 add practice suggestions. Section 1 begins with you listening to another person. Subsequent sections apply empathy to people you work with and then the organization. The last chapter points to your next steps.

The usefulness of Young's method depends on two factors: the number of people involved and the amount of time available. In daily interactions, for example, her suggestions about listening can be useful. Essentially, the listening session is about the other person. How do you manage to keep that focus? Keep yourself out of the conversation: what you might suggest, or ask about, or criticize, etc. The other person needs to be in charge. Your objective is to develop support for the other person, to be attentive so the other person knows that you are interested.

Empathy can have several uses. It can change beliefs or behavior, encourage growth, or better understand another person's reasoning, reactions, and guiding principles. The best approach to accomplish these goals is, after the listening session, to create a summary of what the other person says (an actual transcript is best). You then can analyze what the other person says and look for key points that give clues as to that person's thought processes. If you have quotes, summarize them, centering the summary on verbs.

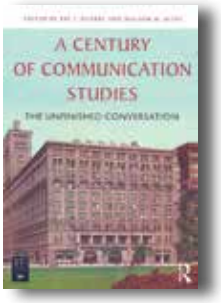
Time versus value is an issue you want to resolve early in the process. To follow Young's complete process (interview, summary, extract quotes, build summary sentences starting with an appropriate verb, etc.) takes time. You can expect to review around 15 analyses in an hour. If you hold listening sessions with, for example, your team and you have 8 to 10 or more on that team, you are committing a large block of time if you follow the whole process. Yet when dealing with coworkers or customers, sympathetic empathy fails to produce the information you need to be a better manager or designer.

When your objective is to understand thought processes and you have the time, Young's method has value. However, you will need to adapt her approach to your specific situation and goals. The point of *Practical Empathy* is that this process humanizes interactions rather than relying on statistical approaches that dehumanize the situation.

Tom Warren
Tom Warren is an STC Fellow, Jay R. Gould Award for Excellence recipient, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he serves as guest professor at the University of Paderborn, Germany.

A Century of Communication Studies: The Unfinished Conversation

Pat J. Gehrke and William M. Keith, eds. 2015. New York, NY: Routledge. [ISBN 978-0-415-82036-3. 308 pages, including index. US$49.95.]



Recounting a particular discipline's history is more than just capturing stories and accomplishments before they are forgotten. As Gehrke and Keith point out, history can also "illuminate the past as well as the present" (p. 1), which is their intention behind putting together *A Century of Communication Studies: The Unfinished Conversation*. Beginning with the 1914 founding of the National Council of Teachers of English and reflecting on issues of importance, this volume uses this arbitrary date to celebrate a discipline that has undergone tremendous change over the past 100 years as a way to discern the contemporary state of the field and anticipate the future.

The book begins with a detailed introduction about disciplinary identity (who are "we"?), building the discipline, and then finding unity within a field that has numerous, diverse focus areas. The chapters cover subjects like recounting historical turning points within the discipline, analysis of scholarship, the scholarly communication of communication scholars, a history of sex/gender in communication studies, and cultural transformations within communication studies, such as the emergence of Black rhetoric, to name a few. Each chapter is impressive in the breadth of content, all which contain a well-researched historical perspective that traces the evolution of the subject matter to the present and concludes with grounded speculation about direction for future research and studies. For example, in "The

Scholarly Communication of Communication Scholars," Stephen points out that the information within communication studies like most disciplines has grown faster than scholars can keep up with, which "promotes fragmentation in the field" (p. 109). However, by analyzing the communication that takes place between communication scholars, individuals can position their own research in the field as well as plan a healthy, robust curriculum within individual academic departments. In this chapter, Stephen presented his study results that analyzed the publication productivity, focus areas, and structure of current scholarship in communication for the past century. In looking to the next 100 years, if change continues at its current rate, the field will be unrecognizable to those who know it today, and the issue of cohesion will remain a challenge for the entire field. Consequently, scholars must be prepared to map the many scholarship avenues "uniting scholars rather than risking their division into increasingly separated areas of research focus" (p. 123). Diversification and cohesion are relevant issues to any discipline, so it is helpful to see how communication studies have changed and yet remained intact during the historical timeline presented in this book.

Written by American communication scholars, *A Century of Communication Studies* focuses only on American communication studies. The intentional writing and tremendous research evidenced in each chapter are two of this book's most impressive aspects; thus, graduate students, scholars, and workplace professionals may find this book easily accessible and useful.

Diane Martinez
Diane Martinez is an assistant professor of professional and technical communication at Western Carolina University. She previously worked as a technical writer in engineering, an online writing instructor, and an online writing center specialist. She has been with STC since 2005.

Writing for the Web: Composing, Coding, and Constructing Web Sites

J. D. Applen. 2013. New York, NY: Routledge. [ISBN 978-0-415-88326-9. 316 pages, including index. US$110.00 (softcover).]

Writing for the Web: Composing, Coding and Constructing Web Sites effectively teaches beginners the basics for producing Web sites. Applen wrote the book for classroom use.

The media theory chapter contains thought-provoking questions that instructors can use for discussion questions or short essay prompts. Chapters two through five include exercises at the end of most sections. Chapter six gives two cumulative projects: a personal Web site project and an informational Web site project. Applen provides sample projects to guide readers. The book's Web site has support materials for instructors and the media files used in the book's examples. Instructors can rearrange the chapter order based on their preference.

The HTML chapter reviews HTML's history, the W3C, and how HTML differs from XHTML and XML (the book teaches XHTML conventions). With plenty of examples and screenshots, Applen explains absolute and relative links, mailto links, anchor links, image maps, and tables. He provides other important information for Web site management: how to save files; how to manage files, folders, and pathways; and how to validate code. I easily followed the chapter's organization.

The CSS chapter explains document/internal CSS, inline CSS, and external CSS, listing the benefits of each. Applen then defines classes, IDs, spans, divisions, and pseudo classes. The next section lists layout techniques from simple to complex. The chapter concludes with alphabetic links, breadcrumbs, tier-system Web site organization, FTP, and metatags. The examples and exercises in the HTML and CSS chapters solidify Applen's lessons.

Both unskilled writers and skilled writers with minimal Web-writing experience benefit from the chapter on rhetoric and writing. Applen teaches punctuation rules, style considerations, MLA citation style, and audience analysis. The rhetoric section discusses *ethos*, *logos*, *pathos*, and *kairos* in depth, relating each term to Web writing. Applen includes sections

specifically for Web writing, such as a section on copyright, fair use, and public domain.

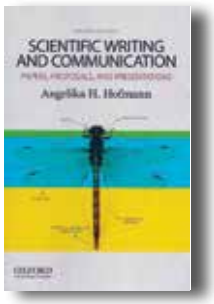
Chapter five discusses Web page layout and Web site organization. Applen suggests how to improve readability with white space, screen length, and margins. When discussing Web site organization, Applen uses screenshots from the Mayo Clinic Web site to show organizing strategies and to explain the purposes of home pages and pathway pages. The screenshots provide concrete examples that elucidate Applen's words.

Applen claims that people who produce Web sites must assume four competent roles as a media theorist, a technician, a rhetorician, and a writer. As a writer who knew little about writing for the Web, I give Applen's book an A–. I noticed a few typos in the code, and I had to reread a number of unclear paragraphs. But overall, *Writing for the Web* gave me a solid understanding of how to produce Web sites.

Alex Boren
Alex Boren has a BS in University Studies from the University of Utah, where he designed an interdisciplinary philosophy degree program. He volunteers as a grant proposal writer for the non-profit Clean Trails and is building his technical writing Web folio.

Scientific Writing and Communication: Papers, Proposals, and Presentations

Angelika H. Hofmann. 2014. 2nd ed. New York, NY: Oxford University Press. [ISBN 978-0-19-994756-0. 728 pages, including index. US$39.95 (softcover).]



Scientific Writing and Communication: Papers, Proposals, and Presentations takes on the large task of covering the gamut of scientific communications: preparing and writing manuscripts, grant proposals, posters, and job applications, as well as giving oral presentations. The two largest sections are those on writing manuscripts and grant proposals, and third in size is the section on writing basics like word choice, sentence structure, paragraphs, and English-as-a-second-language (ESL) concerns. The advice Hofmann gives is generally sound, although the coverage of topics obviously can't be comprehensive, even in 728 pages.

The multitude of exercises and problems in each chapter, such as rewriting sentences for active voice, choosing correct word forms within sentences, constructing a paragraph from a list of facts, and analyzing grant abstracts for the needed elements are a notable strength. The "Answer Key" provides 60 pages of suggested solutions to the problems. The book also contains innumerable examples followed by revisions that improve on the original. These features should be particularly useful to ESL writers. The examples and problems are mainly from the biological and biomedical disciplines.

I found *Scientific Writing and Communication*'s structuring of information hard to follow. Part I, Scientific Writing Basics, presents 30 "rules" about details of English grammar, diction, and structure. Yet it also contains some 18 "guidelines," and I never found a statement of the difference between the two. Surely, "Ensure that every sentence has a subject" (Part I, p. 87) should not be a mere guideline. Part II of the book contains over 40 guidelines, but no rules. Parts III to V contain "structural guidelines" for various topics, such as 10 guidelines for abstracts in Part III and 27 guidelines for oral presentations in Part V. I did wonder whether so many individual instructions are a help or a hindrance to the reader trying to apply all this advice to the actual writing process.

Too many editorial misses mar the book's presentation and value. Rule 2, "Use precise words," on pp. 12–13, has three examples and revisions. The accompanying discussion states that "enhanced" is an imprecise and wrong word choice, but that word is not in any of the examples. Section 4.9 is "Lists and Comparisons" but treats only lists; Section 4.10 is "Faulty Comparisons." While punctuation point 8 (p. 70) states "Avoid quotation marks," the text below tells how to use them correctly—so why not drop "avoid" from the head? On p. 64, the advice is to spell out "percent" in formal writing and use "%" in informal, but science and engineering authors routinely use the percent sign. Lastly, the unit abbreviation for hour is "h" and for day is "d"; both should be used correctly with numeric values in a book on scientific writing.

The numerous examples and problems presented in *Scientific Writing and Communication* would be helpful to ESL readers, but overall, I would not recommend this book.

David Nadzjieka
David E. Nadziejka is the biomedical editor at the Van Andel Research Institute in Grand Rapids, MI, and an STC fellow. He has been a science and engineering editor for 25 years and has taught technical communication at the Institute of Paper Chemistry, Argonne National Laboratory, and Illinois Institute of Technology.

Josef Müller-Brockmann: Poster Collection 25

Bettina Richter and Museum für Gestaltung Zürich, eds. 2014. Zürich, Switzerland: Lars Müller Publishers. [ISBN: 978-3-03778-392-4. 96 pages, including catalogue. US$40.00 (softcover).]

Josef Müller-Brockmann: Poster Collection 25 offers a succinct account of the objective clarity of Müller-Brockmann's individual methodology and approach to design problem solving through his extraordinary body of poster designs. This book has a rich source of posters reflecting an early illustration style to a purity of graphic form and evolving design sensibility reflecting the mid-19th century to present day. As Richter notes, "it was not the idea to make a catalogue raisonné of all his posters, but to show his development from illustration to concrete posters and to focus on the construction of Swiss Style in his work" (pp. 6–11).

Müller-Brockmann, a leading theorist, educator, and practitioner of postwar Swiss Style, was one of the 20th century's most influential, prolific voices in graphic design. The Swiss School, also called "International Style," materialized from Switzerland as a singular, uniquely clear graphic language and design movement during the 1950s and 1960s. The "Neue Grafik" or "Swiss Style," originated in Russia, Germany, and the Netherlands during the rebellious cultural and political turbulence of the 1920s. This style was invigorated by artistic expression in avant-garde movements and the major architectural "International Style" that developed during this period in Europe and continued into the 1930s.

The book traces the origins of Müller-Brockmann's poster development sequenced chronologically over a 25-year period. Two essays, "In Public Space" by Lars Müller and "The Grid of History" by Catherine de Smet explain Müller-Brockmann's work in the public realm and central role in disseminating Swiss design in his writing and publishing activity. Each essay helps frame and place Müller-Brockmann's oeuvre and publications in a historical context and reflect the spirit of the times.

The Museum für Gestaltung–Schaudepot's poster collection is an all-inclusive, remarkable archive of the poster's history in Switzerland and throughout the world beginning in the 19th century to the contemporary era. In Richter's words, "It was always the idea to find a way to show the treasures of our collection with about 350,000 posters arranging them by themes, graphic designers and so on and to illustrate not only graphic design questions but also looking at posters as a part of a cultural and historical heritage. We tried to find a layout which give us in a pattern easily to copy for every new book a possibility to show large images and groups of posters" (pp. 32–33).

Josef Müller-Brockmann: Poster Collection 25 is a captivating, concise historical analysis, accompanied by many examples of Müller-Brockmann's extensive body of poster designs. This must-have book reveals how Müller-Brockmann's expressive style through objective clarity, mathematically constructed grids, modernist elements, and constructivist ideals remains an all-important part of our present-day graphic language. It is an indispensable guide for design students interested in Swiss typography as well as essential reading for professional designers, or anyone interested in 20th century graphic design history.

Richard B. Doubleday
Richard B. Doubleday is an assistant professor in the Department of Graphic Design at Louisiana State University's School of Art. He is a contributing author for Ornament and Initial: Beauty of Graphic Design, 17-20th Century, Phaidon Archive of Graphic Design, and Meggs' History of Graphic Design.

Revising and Editing for Translators

Brian Mossop. 2014. 3rd ed. New York, NY: Routledge. [ISBN 978-1-909485-01-2. 254 pages, including index. US$42.95 (soft cover).]

Revising and Editing for Translators is part of the "Translation Practices Explained" textbook series. That series is for students in university-level translation programs. The book explains the entire process of changing a translated text—from what editors and revisers do through the different types of editing and revision, the parameters to consider when revising a text and on to recommended procedures. Each chapter concludes with suggestions for practice and a set of related exercises.

This is the latest edition, yet the section on computer aids for revision and editing tasks discusses in detail how to use various review features in Microsoft Word 2007. By now, most professionals have moved on to newer versions of that program. I recommend a change to this chapter in the next edition to discuss the review features in word processing programs and not reflect a newer version of Word. The university professor can always add more instructions.

Although *Revising and Editing for Translators* was written as a textbook, professional translators will also find Mossop's explanation of different types of editing, as well as the various considerations that (should) go into editing one's own work or that of a colleague interesting. I realized that many of my practices during revision were based on theoretical principles I had never really thought about. Those of us who have never been formally trained in translation theory can use this book—and perhaps other books in the series—to catch up on some of the foundations of our profession.

That said, many of the considerations and processes Mossop proposes are simply too time-consuming for practicing translators who need to meet often tight deadlines. He does acknowledge the time constraints under which we work and suggests that his best practices may not always be followed. Mossop's discussion of different levels of quality and the fact that top quality takes time, but is not always necessary, can be quite helpful during client negotiations. Similarly, the chapters on revision procedures and the differences between revising one's own work and that of others may well cause some of us to re-think how we approach such tasks.

Overall, the book is a worthwhile read for translators who have worked in the profession for many years, but it is even more helpful for those who are new to translation or are, in fact, still students.

Barbara Jungwirth
Barbara Jungwirth owns reliable translations llc (www.reliable-translations.com) where she translates technical documents from German into English. She was previously a technical writer and IT manager, and currently serves on the board of STC's New York Metro chapter. Barbara writes a blog (On Language and Translation) and tweets (@reliabletran).

Health Communication: Theory, Methods, and Application

Nancy Grant Harrington, ed. 2015. New York, NY: Routledge. [ISBN 978-0-415-82454-5. 504 pages. US$63.95 (softcover).]

Health Communication: Theory, Methods, and Application is a textbook authored by academics and doctoral candidates in various health communication fields. Editor Nancy Grant Harrington, PhD states in the preface that she hopes the text fills the gap in information meant for undergraduates in upper-division health communication courses (p. xx).

The book's organization and topics covered are the main strengths. There are 16 chapters on key health communication topics, starting with basic topics such as "The Patient Experience," and moving on to more specific topics like "Mental Health and Illness" and "Internet and eHealth." Each topic can stand on its own as a unit, and academics teaching these courses could easily use additional readings and films to support the topics.

The chapters are structured in a clear manner, with headings to identify the main topics. Key terms are highlighted and placed inside text boxes. Most of the chapters begin with a discussion of the main concepts and theories, and then move to case studies and specific examples of these concepts at work. A few chapters, such as "Understanding Caregiver Challenges

and Social Support Needs," were more difficult to read because they contained too many examples and skipped back and forth, presenting one or more case studies, interrupting a case study to present a key concept, and then returning to the original case study without a clear transition. These chapters read more like a literature review for an academic article rather than a textbook chapter.

The chapter review questions at the end are an asset. These exercises contain complex, but valuable topics for projects or short papers that ask the students to apply what they have learned to a real situation involving health communication.

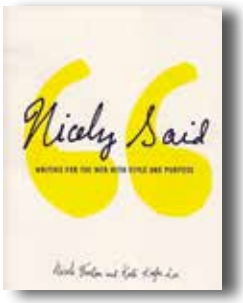
The chapters are well written as a whole, but they are inconsistent in tone. Although Harrington states that she strove for an "engaging, even humorous style" (p. xxi), only the chapters co-written by Harrington demonstrate any attempt to adhere to this style. The remaining chapters tend to use plain language and a factual tone. As an academic coming from the technical communication field, I actually preferred these matter-of-fact chapters more, since they are easier to understand and contain fewer distracting tangents. I suspect that my students would feel similarly, since much of the text's humor depends heavily on references from pop culture that some students may not be familiar with, such as dated movie and music references and advertising jingles.

As an academic who is planning to teach an undergraduate health communication course, I was particularly interested in this textbook. I believe that Harrington met her goal of creating a timely, accessible book for upper-level students. Despite its drawbacks, *Health Communication* is a book that I would feel comfortable adopting for this purpose because of its strong organization and the importance and timeliness of the topics covered outweigh the inconsistencies.

Nicole St. Germaine-Dilts
Nicole St. Germaine-Dilts is an associate professor in the Technical and Business Writing Program at Angelo State University. Her research interests include technical communication for a Mexican–American audience and technical communication in the health fields.

Nicely Said: Writing for the Web with Style and Purpose

Nicole Fenton and Kate Kiefer Lee. 2014. San Francisco, CA: Peachpit Press. [ISBN 978-0-321-98819-5. 184 pages, including index. US$29.99 (softcover).]



Nicely Said: Writing for the Web with Style and Purpose is a basic primer on creating content for various online purposes. As such, a reader learning to write Web copy can use this book to help create a foundation for Web writing principles. More experienced readers can use it as a refresher; the Web writing principles remain constant, and brushing up on them is a useful exercise. It's easy to choose among the topics covered because authors Fenton and Lee list the subjects of each chapter on the first page.

As the authors point out correctly, writing is not the first step in the writing process. They speak from experience—they are both professional writers and editors who teach others their skills. They guide readers through the preliminaries of planning and research necessary for getting to the writing stage. Throughout *Nicely Said*, Fenton and Lee reinforce the importance of understanding the writer's audience and keeping these "real people" at the center of all planning and writing. Their advice on writing is to keep it "clear, useful, and friendly" (p. 43). In my opinion, this is the best advice any Web writer can receive. The authors provide many examples of how to do this, while demonstrating how to establish a tone and style for a Web site or blog, and give examples of content that needs special handling, such as help documents and unsubscribe confirmations.

Fenton and Lee take their own advice by writing clearly and laying out their book in such a straightforward way that whether you are a "writer, editor, blogger, content strategist, designer, developer, or small business owner" (p. vii), you will breeze right through it. *Nicely Said* will give you some tools and overarching ideas about building a Web presence, using social media, creating interfaces that make sense, and marketing and selling online, but does not provide enough details to complete a Web site. This is primarily a guide to creating "useful and meaningful web content" (p. vii).

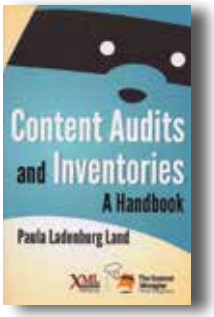
While Fenton and Lee talk about the importance of developing a style early on, they don't discuss style guides until the last chapter. I would have preferred to see the use of a style guide included as part of the planning and writing process instead of treated as a kind of overlay to the finished product. As the authors themselves confirm, such guides contribute to consistency and clarity, and are beneficial from the beginning of the process.

Fenton and Lee created an imaginary online bookstore that works well for demonstrating techniques they introduce throughout *Nicely Said*. Contemporary real-world examples are scattered throughout the book as well, sometimes in the form of sidebar stories. A bibliography is a useful addition to *Nicely Said*.

Linda M. Davis
Linda M. Davis is an independent communications practitioner in the Los Angeles area. She holds an MA in Communication Management and has specialized in strategic communication planning, publication management, writing, and editing for more than 25 years. Linda is active in the STC Los Angeles chapter.

Content Audits and Inventories: A Handbook

Paula Ladenburg Land. 2014. Laguna Hills, CA: XML Press. [ISBN 978-1-937434-38-0. 138 pages, including index. US$24.95 (softcover).]



Paula Land's book, *Content Audits and Inventories: A Handbook*, provides an excellent tutorial on this critical content strategy step. As she aptly puts it, spending time up front avoids potentially disastrous implementations (p. xvi, paraphrased). If you don't know where you currently are, it's very difficult to plan a path to where you want to be.

While Land focuses only on Web content, and neglects to mention user documentation, many of the techniques apply to any content type, with some modification. This book is a practical, customer- and business goals-focused guide to conducting content audits and inventories. As Land emphasizes, you need to focus on what's realistic and meet your business goals, while looking for quick wins to build engagement.

She provides several tips on saving money during the audit process, such as "quick and dirty" usability testing using a couple of users to test aspects of the customer journey; taking a cross-section of related content to review instead of trying to look at everything; and looking behind the data to understand why a page might not be getting the views it should by balancing bounces against time on the page. In each chapter, she includes resources and ideas for being efficient, while emphasizing that "an audit is not a one-time project, but a repeatable and regularly scheduled process" (p. xiv).

If there are any content weaknesses in *Content Audits and Inventories*, it's in Chapter 12, "Auditing for Global Issues." One of her examples, the infamous Chevy Nova story, is an urban legend and is not real. Nitish Singh and his coauthor were describing the work of Geert Hofstede in their work, yet the book does not cite Hofstede. This chapter could also do more to discuss examining the localization process as part of the audit, and the importance of integrating localization into the content creation process. Throughout the book, some of the graphics are a bit difficult to read (especially the one with a blue background and white text in Appendix E), but these are minor distractions.

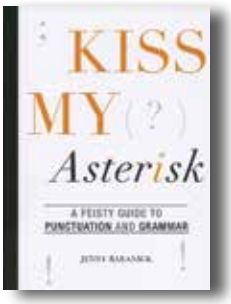
The resources in the appendices alone are worth the book's price. This book goes on my must-have bookshelf for anyone interested in content management, content strategy, or information architecture, as well as anyone facing a major content management system or Web site retooling.

Though the *Content Audits and Inventories* doesn't push Land's cloud-based tool known as CAT, this tool (or one like it) should be in every Web manager's toolbox because it takes the drudgery out of the content inventory and automates it.

Katherine (Kit) Brown-Hoekstra
Katherine Brown-Hoekstra, of Comgenesis, LLC, is a Fellow and current immediate past president for STC, speaks at conferences worldwide, and has authored many articles on various topics related to technical communication and internationalization. She has a background in life sciences and 25+ years of experience. She also coauthored a book on managing virtual teams.

KISS MY (?) Asterisk: A Feisty Guide to Punctuation and Grammar

Jenny Baranick. 2014. New York, NY: Skyhorse Publishing. [ISBN 978-1-62873-750-9. 168 pages, including index. US$14.95 (softcover).]



KISS MY (?) Asterisk: A Feisty Guide to Punctuation and Grammar is about avoiding basic grammar errors that confuse readers, that make writers look uneducated, and that undermine writers' confidence. This book is not for those looking for in-depth or obscure grammar rules; it is more like a refresher for experienced writers and a good introduction to show non-grammarians how to write more clearly using grammar rules.

In her teaching career, Baranick sees the common grammatical errors that writers inject and addresses those in her book. She uses a conversational tone, making it seem as though you both are sitting at a table over coffee or tea, while she intimately discusses those errors and how not to make them in the future.

As the title suggests, this book is irreverent, yet relevant. Baranick sometimes uses slightly off-color humor to present grammar and punctuation rules and tips. *KISS MY (?) Asterisk* is not for readers who are squeamish about examples based on morality lapses or the use of mild profanity. All other readers will most likely engage in a chuckle or two while witnessing grammar come alive through vivid and fun examples. It might be prudent for those who may not like the examples to get a copy from the library first to see if the book is usable. If you find that it is, then purchase a copy that will most likely become dog-eared and marked up. Not all examples are potentially offensive; many are just plain entertaining.

You may be familiar with a few of her examples from the 1960s and 1970s (hint—watch reruns of "Gilligan's Island"); other examples are more current. To help you remember these particular grammar rules and tips, she brings in an eclectic group, including the gang on "Gilligan's Island," Juliet Capulet, fairy tales, the cast of "Friends," Paris Hilton, and more.

It is not necessary to read *KISS MY (?) Asterisk* from front to back, but Baranick does occasionally refer to previously mentioned explanations or examples. There are 17 chapters, each one covering a specific aspect or group of items, like "More than a Feeling: Commas" (Chapter 5), "Goldilocks and the Three Bears: En Dashes, Em Dashes, and Hyphens" (Chapter 8), and "Looks Matter: Formatting Academic Papers, Letters, and Résumés" (Chapter 16). Baranick includes practice exercises at the end of each chapter with the first exercise being a mini-crossword puzzle. You will find an answer key to the exercises near the end of the book.

Sherry Shadday
Sherry Shadday works for Southwest Research Institute in Utah as a principal technical specialist in configuration management and software engineering test documents. An STC member, she retired from the U.S. Air Force as an aircraft electrical systems maintainer and has a technical communication master's degree from Utah State University.

Does Your Content Work? Why Evaluate Your Content — and How to Start

Colleen Jones. 2014. San Francisco, CA: Peachpit Press. [ISBN 978-0-13-376507-6, 58 pages. US$15.00 (E-book).]

Does Your Content Work? Why Evaluate Your Content — and How to Start is a how-to book that helps readers discover if their content is truly effective. Throughout this book, readers learn how to evaluate if content is working for users. Jones gives readers a walk-through on the evaluation process and shows how to set goals for your Web site. Starting with business goals helps the readers frame why those goals are important in measuring the content experience.

Jones continues by stating the importance of understanding quantitative data (user interviews, surveys, usability testing) and how to evaluate the data you receive. She continues with how qualitative data is not an effective way to emulate content over time. After finding this user information, many tend to overinterpret or underinterpret the data. Jones gives examples of the common mistakes and leads readers into what to do to evaluate the information properly.

Does Your Content Work wraps up the book with the idea that content evaluation is never done. Jones gives two courses of action in which to choose. One is to "confirm and continue" (p. 48), in which if something works to continue without changing it, and if something isn't working, you'd find a way to fix it. The second being "adjust or optimize," in which you decide that you want to try to test new content types to try to make the user experience better (p. 48). Jones mentions using A/B testing if you want to compare two different content types with users. This lets you compare different options with users to see which one performs better.

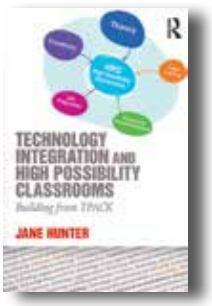
At the end of the book, readers have handy tools and resources to use when completing content evaluations. You can use these tools along the way to help track where users are from, how they enter your Web site, devices they use, or what they do once they arrive on the site. When completing an evaluation of your content, these tools can become useful when receiving data, compiling data, or implementing changes.

I enjoy how Jones provides tools and resources to look into for those who are learning about how to evaluate content and why it is important. *Does Your Content Work* has a sleek layout that is easy to scan and find sections you need when working with your Web site. Users can depend on the simplicity in style and the use of images to make it an easy read. This isn't a book you will use once and then never pick up again. You will return to this book throughout your journey when evaluating your Web sites' content and implementing changes.

Kristi Wiley
Kristi Wiley is currently a PhD student in Rhetoric and Writing at Michigan State University. She focuses her research on UX, content strategy, technical writing and editing, usability, and Information Architecture.

Technology Integration and High Possibility Classrooms: Building from TPACK

Jane Hunter. 2015. New York, NY: Routledge. [ISBN 978-1-138-78133-7. 204 pages, including index. US$49.95 (softcover).]



Hunter's book delivers what its title promises: an evaluation of integrating technology into classrooms that further develops the Technological Pedagogical Content Knowledge (TPACK) model as first presented in 2006 by Mishra and Koehler. A solid, but brief, justification for another book on technology integration greets the reader. Hunter explores general technology trends in Australia, the United States, the United Kingdom, South Korea, and Singapore, and situates the reader with a sense of common technology-related challenges and practices in diverse educational systems.

The second chapter provides the theoretical basis of Hunter's work. She covers how technological, pedagogical, and content knowledge differ as well as how they blend with each other, for example when technological and pedagogical or content and pedagogical overlap. Hunter then discusses what TPACK looks like when all the knowledges are applied together. Her presentation builds on existing resources, such as the tpack.org Web site, and Mishra and Koehler's own explanations in their original 2006 article and 2008 introduction to TPACK in the *Handbook of Technological Pedagogical Content Knowledge*. Next up is Substitution, Augmentation, Modification, and Redefinition (SAMR). This discussion is short; however, Hunter applies the SAMR lens regularly throughout the text. She shows how her own High Possibility Classrooms (HPC) framework builds on TPACK and SAMR.

Chapters three through six are case studies of four different classrooms and teachers and four different age groups: early years (K–2), elementary, middle, and high school. This approach is useful and practical in that it offers a different lens from the 2008 TPACK Handbook because that handbook focused on TPACK in specific content areas as opposed to grade levels. The grade-level emphasis also makes these chapters ideal for using apart from the whole text—especially for those teaching technology workshops or mentoring new teachers.

Chapter seven, "Creating High Possibility Classrooms," reviews the HPC model and its component pieces. The chapter connects the HPC model's five key parts with larger theory and research; Hunter then connects each component to multiple case study examples. This discussion of connections also reviews the material presented for readers, allows for a holistic view of the HPC model, and demonstrates how HPC might appear in diverse grade levels.

Finally, Chapter eight covers how theory, creativity, public learning, life preparation, and contextual accommodation can help make HPC happen in schools worldwide. Faculty can use this chapter to help students better understand the relationship between theory and practice.

While *Technology Integration and High Possibility Classrooms* is meant primarily for teachers and teacher educators, TPACK can be readily adopted and used for higher education. What's needed is more extrapolation on how to apply the ideas and activities. Similarly, Hunter's HPC model is, like TPACK, one that higher educators can use to help in examining and improving their technology integration. Hunter's text is an excellent exemplar for faculty teaching case study research, educational technology, or how theory impacts practice.

Gregory Zobel
Gregory Zobel is an assistant professor of Educational Technology at Western Oregon University. Trained in technical communication, usability, and rhetoric, he supports and trains educators employing technology to enhance and enrich learner engagement, accessibility, and content delivery in person and online.

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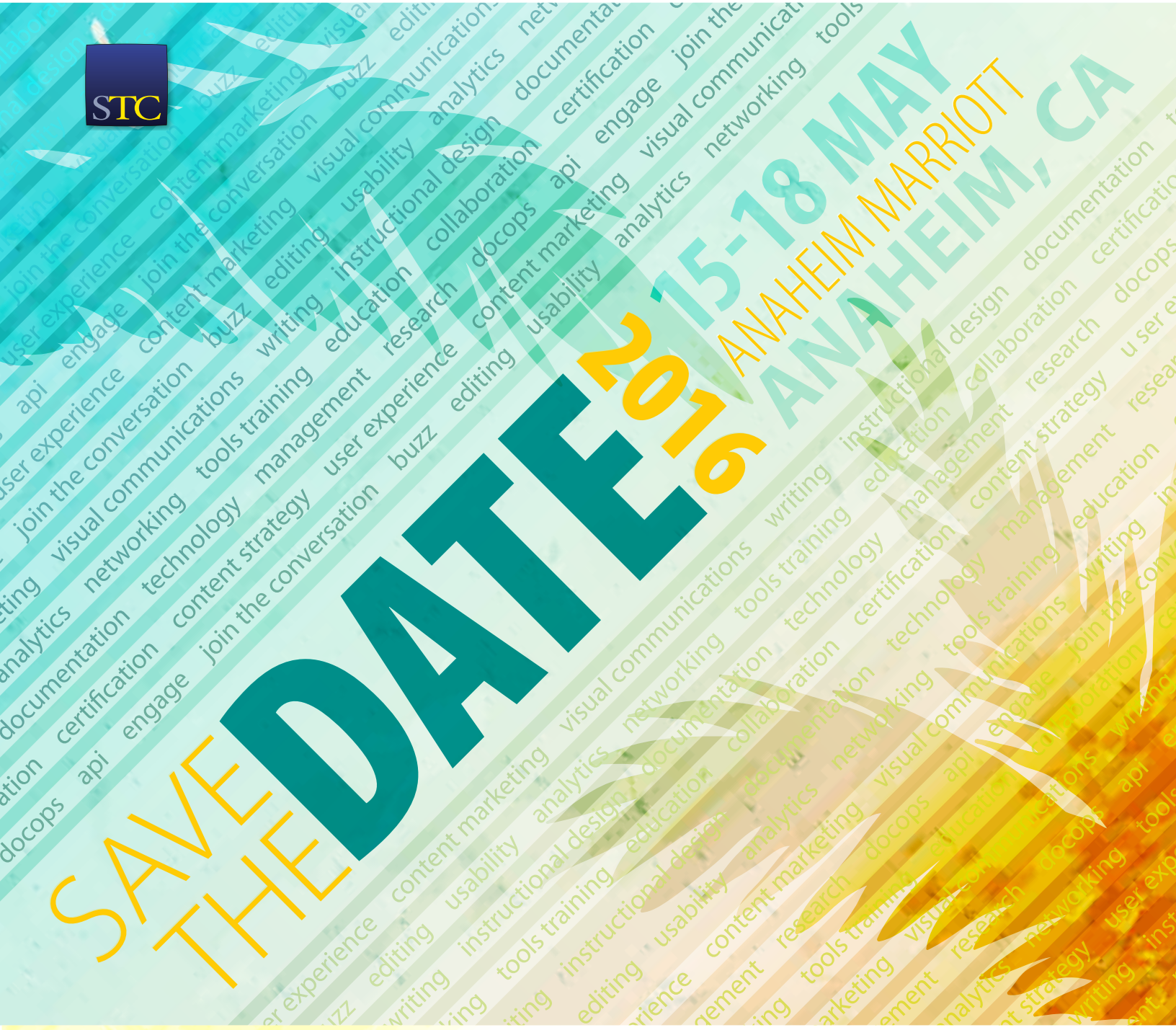

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Lyn Gattis, Editor

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Communication

Are we on the same page? Knowledge boundaries and transactive memory system development in cross-functional teams

Kotlarsky, J., van den Hooff, B., & Houtman, L. (2015). *Communication Research, 42,* 319–344. doi: 10.1177/0093650212469402

"One of the key challenges that organizations face when trying to integrate knowledge across different functions is the need to overcome knowledge boundaries between team members. In cross-functional teams, these boundaries, associated with different knowledge backgrounds of people from various disciplines, create communication problems, necessitating team members to engage in complex cognitive processes when integrating knowledge toward a joint outcome. This research investigates the impact of syntactic, semantic, and pragmatic knowledge boundaries on a team's ability to develop a transactive memory system (TMS)—a collective memory system for knowledge coordination in groups. Results from [the authors'] survey show that syntactic and pragmatic knowledge boundaries negatively affect TMS development. These findings extend TMS theory beyond the information-processing view, which treats knowledge as an object that can be stored and retrieved, to the interpretive and practice-based views of knowledge, which recognize that knowledge (in particular specialized knowledge) is localized, situated, and embedded in practice."

Lyn Gattis

Design

Developing a design brief for a virtual hospice using design tools and methods: A preliminary exploration

Taylor, A., French, T., Lennox, J., & Keen, J. (2015). *Visible Language, 49*(1, 2), 96–111. [doi: none]

"Providing equitable access to specialist palliative care, regardless of diagnosis or geographical location, with relatively limited resources and an ageing population, will become increasing difficult for all hospice services. This paper describes the development of a Design Brief for a Virtual Hospice using design tools and methods. The main aim of the Virtual Hospice in this case is to improve access to services provided by the Highland Hospice in Inverness, Scotland. The project began by observing Hospice staff and their interactions with patients. Three User Personas were then created based on data gathered through interviews with a small number of patients and professionals. Each Persona's progress through the Highland Hospice service was visualised on a User Journey Map in the form of insights and opportunities, with five key themes emerging. The final step involved producing a Design Brief that synthesised the research findings in the form of a plan for creating, prototyping and testing the Virtual Hospice."

Lyn Gattis

Using icons to overcome communication barriers during emergencies: A case study of the Show Me interactive tools

Patton, A., Griffin, M., Tellez, A., Petti, M. A., & Scrimgeour, X. (2015). *Visible Language, 49*(1, 2), 80–95. [doi: none]

"This case study reviews the development of three icon-based tools designed to help workers and volunteers during an emergency communicate with people who have communication challenges, such as limited English proficiency, deafness or hearing impairments, and cognitive delays. Using the classic human figure icons designed by the American Institute of Graphic Arts (AIGA) for the U.S. Department of Transportation (DOT) as a basis, [the authors] developed over 250 new icons for the tools, a dry erase booklet and two mobile applications for Apple and Android devices. [The authors] outline the challenges [they] faced researching, testing, and developing the icons. [They] also explore interactivity, animation, and the grouping of icons and suggest ways to push icon design in new directions. . . ."

Lyn Gattis

Designing a visual tool to interview people with communication disabilities: A user-centered approach

Noël, G. (2015). *Visible Language, 49*(1, 2), 62–79. [doi: none]

"To design in collaboration with users, speaking and listening are essential. This article shows the process of interviewing people with a communication disability called aphasia. Aphasia is caused by brain damage and affects speaking, understanding speech, reading, and writing to some degree. The focus of the article is on the creation of visual tools to facilitate the understanding of questions and producing answers by people with aphasia. Everything has to be adapted to match their needs: the wording, the types of questions, the way a question is introduced, and the length of the interview, among other things. For every question, specific material was designed to facilitate communication between the person interviewing and the person with aphasia. The strategy was to combine verbal information (oral and written), pictorial information, and movement. The main goal of the interviews was to understand the feelings and opinions of people with aphasia regarding the diagnosis process. The interview results helped identify people's preferences regarding the context in which the assessment takes place, as well as their needs regarding the visual materials used. The project demonstrated that it is possible and valuable to apply a user-centred design approach to the design of the visual material used to assess aphasia."

Lyn Gattis

Education

Examining the relationship between technology and idea generation in the document design process

Lauer, C. (2015). *Journal of Business and Technical Communication, 29,* 367–402. doi: 10.1177/1050651915588146

"This article proposes a more complex consideration of the idea-generation stage of the document design process. Survey data collected from multiple sections of graphic design and technical communication classes show that design software and other technology can help students generate solutions to design problems by enabling them to realize design options that they may not have known exist and to adopt a bricolage approach to design that facilitates the process. The author makes several recommendations for how instructors can negotiate the sketching-software divide in their classrooms to ensure that the invention process is optimized for all students."

Sean C. Herring

Filter. Remix. Make. Cultivating adaptability through multimodality

Dusenberry, L., Hutter, L., & Robinson, J. (2015). *Journal of Technical Writing and Communication, 45,* 299–322. doi: 10.1177/0047281615578851

"This article establishes traits of adaptable communicators in the 21st century, explains why adaptability should be a goal of technical communication educators, and shows how multimodal pedagogy supports adaptability. Three examples of scalable, multimodal assignments (infographics, research interviews, and software demonstrations)

that evidence this philosophy are discussed in detail. Asking students to communicate multimodally drives them to effectively filter information, remix modes, and remake practices that are core characteristics of adaptable communicators. Beyond teaching students how to teach themselves as an essential part of living in an information society, contending with new and unfamiliar tools also prepares students for their roles as empathic mediators in the workplace."

Anita Ford

Teaching professional communication in a global context: Using a three-phase approach of theory exploration, self-assessment, and virtual simulation

Grant, K. A., Lainema, T., Tuleja, E., & Younger, J. (2015). *Rhetoric, Professional Communication and Globalization, 8,* 4–21. [doi: none]

The authors of this article assert that students do not fully grasp "the realities of international communication, multicultural collaboration, and dispersed global work" through standard teaching methods and case studies. Instead, the authors "believe that hands-on experiential, collaborative exercises—combined with the metacognitive exercise of reflective practice—offer greater learning potential. . . . This paper discusses a recent teaching endeavor across three universities in the USA, Finland, and Austria. The authors of this paper collaborated on a project to link business students via a virtual team simulation, called Virtual Teams in International Business (VIBu - http://www.vibu.fi)." The article discusses "behavioral assessment of the intercultural communication skills needed for effective global interaction . . . the global simulation used in this VIBu project . . . [and] implications and the potential of future pedagogical models, which hold much promise for teaching professional communication in global contexts."

Lyn Gattis

Ethics

Open culture and innovation: Integrating knowledge across boundaries

Powell, A. B. (2015). *Media Culture & Society, 37,* 376–393. doi: 10.1177/0163443714567169

"What does open source mean for culture? For knowledge? As cultural production has come to be characterized by contribution as well as consumption and as alternative modes of intellectual property transfer challenge the 'dominant paradigm' that knowledge and information should be protected and monetized, the logic of 'open sourcing' has extended into many cultural spheres. This article positions 'openness' as a value that intermediates between re-usable software code, institutional transparency, and expanded opportunities for participation in knowledge production cultures. By observing and analyzing the expansion of 'openness' from computer software to electronics hardware, we can develop a framework that identifies the tensions between socio-cultural visions of knowledge commons and the realities of governing those commons. This research focuses in particular on the knowledge related to electronics hardware and other material objects governed by open hardware licenses. The insights in this article are valuable for anyone studying open source and peer production processes and the knowledge claims surrounding them."

Lyn Gattis

Health communication

Designing and evaluating a health program in Africa: Hygiene Matters

Zender, M., & Plate, D. K. (2015). Visible Language, 49(1, 2), 40–61. [doi: none]

"Parasitic intestinal worms are a leading cause of poor school performance of children in Africa and a leading predictor of low quality of life for a lifetime. Deworming medication is effective and inexpensive yet experience shows that unless measures to improve hygiene are taken those who are rid of worms through medication are often re-infected within months. Responding to

this, Hope Educational Foundation in partnership with a student/faculty design team from the University of Cincinnati designed, developed, and tested a hygiene educational program as part of a comprehensive de-worming program in Africa. Hygiene Matters was designed with African-user participation, employed visual-story for communication, and was tested in the Central African Republic in 2012 with a larger pilot study in Togo in 2013-14. While hygiene knowledge increased significantly with the curriculum, practices did not increase significantly, and testing revealed flaws in the study protocol that need to be corrected in future evaluations. This project suggests that designers need to improve their ability to conduct research establishing program effectiveness in health outcome terms as designers move from creating individual artifacts aimed to meet client specifications to creating programs that aim to change health outcomes."

Lyn Gattis

Information management

Managing metadata for responsive web sites with subject schemes

Katajisto, L. (2015). *Best Practices, 17,* 77, 81–82. [Center for Information-Development Management]

This article discusses a web team's testing of subject schemes in fluid, responsive web sites as a way of defining and maintaining metadata outside DITA topics. "Subject schemes are specialized DITA maps that define a collection of controlled values instead of a collection of topics. Subject schemes also allow the creation of relationships between those values. In other words, subject schemes provide a way to create simple and not-so-simple taxonomies." During development, the team found that subject schemes were less efficient with flat metadata, such as defined categories. They were most effective with "multifaceted and hierarchical metadata, [which] needed relationship information." Successful examples include using subject schemes "as the metadata source for XML editor drop-downs and also for faceted search and search UI."

Lyn Gattis

Instructions

Get ready for augmented reality in the workplace

Babb, G. (2015). *Best Practices, 17,* 53, 56–58. [Center for Information-Development Management]

The author of this article defines augmented reality (AR) as "a blend of VR [virtual reality] with physical reality. AR creates an illusion that digital information exists in the real world but it is not complete immersion into a virtual world." AR can include mobile devices, computer-based displays, or projections that "efficiently guide us in complex tasks, whether those involve assembling wiring in satellite panels, replacing components in an operational radar, inspecting thermal data and other diagnostics of a heating system, or learning truck engine maintenance under the live guidance of a remote expert." The author suggests that "AR can be seen as another facet of technical communication, with new skills and design paradigms required for shifting instructions from paper- and screen-based help into the user's field of view." Best practices for AR design and content are still developing, but necessary skills are likely to include "knowledge of usability, graphic design, and of technologies such as HTML, CSS, and JavaScript," along with wireframes, instructional design, experience with modular content, and "interaction design practices such as progressive disclosure."

Lyn Gattis

Intercultural issues

The guide to Kuan Hua: Language and literacy in the 19th-century Chinese business environment

Sinclair, P., & Blachford, D. (2015). *Journal of Business and Technical Communication, 29,* 403–427. doi: 10.1177/1050651915588144

"This article examines the *Guide to Kuan Hua*, arguably the world's first business Chinese textbook series, exploring how a group of business communication experts in late 19th-century China created instructional

materials that allowed foreigners to function efficiently in China's business and bureaucratic environment. Rather than simply focusing on the mechanics of language, editors of the series fostered in students a set of literacies that would help them cope with the tumultuous change in 19th-century China. This study suggests that the experience of 19th-century textbook editors may inform our approach to complex intercultural communication challenges in today's globalized world."

Sean C. Herring

Professional issues

What is meant by user experience? Analyzing usability/ user experience professionals' dynamic representations of self

Zantjer, R., & Gonzales, L. (2015). *Journal of Usability Studies, 10,* 215–227. [doi: none]

"This research investigates the ways usability/user experience professionals describe themselves for different audiences and across multiple digital platforms, including LinkedIn, Twitter, portfolio websites, and business websites. By analyzing the digital identities of over 40 usability/user experience professionals, this article presents quantitative and qualitative pictures of how usability and user experience is being described in digital spaces. This article highlights broad patterns and specific tactics being implemented by four types of usability/user experience professionals and gives recommendations for how these tactics can be modified and applied for other usability/user experience professionals attempting to create professional identities in digital spaces."

Ginnifer Mastarone

Research

Building identity and community through research

Rude, C. D. (2015). *Journal of Technical Writing and Communication, 45,* 366–380. doi: 10.1177/0047281615585753

"A field's identity and sustainability depend on its research as well as on programs, practice, and infrastructure. Research and practice have a reciprocal relationship, with practice identifying research questions and researchers answering those questions to improve practice. Technical communication research also has an exploratory purpose, using the knowledge and methods of the field to explain how texts work in a variety of contexts. A gap between research and practice developed in the 1990s. Defining explicitly how the parts of our research and our practice connect to form a whole will give the field a stronger identity."

Anita Ford

An experience in requirements prototyping with young deaf children

Korte, J., Potter, L. E., & Nielsen, S. (2015). *Journal of Usability Studies, 10,* 195-214. [doi: none]

"Deaf children are an underrepresented group in technology development, despite the potential technology available to aid them in language acquisition. Requirements elicitation prototyping allows Deaf children to act in an informant role in the creation of key technologies. This paper presents a case study of requirements elicitation prototyping conducted with young Deaf children in order to identify issues within the process. Potential solutions to each issue are provided so that designers working with young Deaf children as informants can adjust their design process to obtain relevant information."

Ginnifer Mastarone

Mapping a space for a rhetorical-cultural analysis: A case of a scientific proposal

Dorpenyo, I. K. (2015). *Journal of Technical Writing and Communication, 45*, 226–242. doi: 10.1177/0047281615578845

A rhetorical-cultural analysis of the text of a funding proposal argues that "scientific writing is rooted in a cultural practice that valorizes certain kinds of thought, practices, rituals, and symbols; that a scientist's work is grounded and shaped by an ideological paradigm; hence, scientific texts have material existence. [The author finds] that science writing is kairotic, selective, and persuasive. The results . . . provide enough insights for technical communicators to think about the role that institutions and disciplines play in knowledge production. . . . Technical communicators will not only think about rhetorical moves when they are composing, they will also think about the articulations between contexts and ideological practices and how they shape the identity of writers and communicators."

Anita Ford

Science communication

Communicating scientific uncertainty: Media effects on public engagement with science

Retzbach, A., & Maier, M. (2015). *Communication Research, 42,* 429–456. doi: 10.1177/0093650214534967

"Scientific results are always afflicted with some uncertainty, especially where emerging technologies are concerned. While there are normative and practical reasons to call for an open admission of scientific uncertainties, concerns about detrimental effects of such communication on public engagement with science have been raised in the literature. The present study was conducted to investigate how the communication of scientific uncertainty in nanotechnology influences laypeople's interest in science and new technologies, beliefs about the nature of science, and trust in scientists. In a longitudinal field experiment, 945 participants were exposed to six real-world media reports (TV features and newspaper articles) on nanotechnology. Contrary to [the authors'] expectations, the communication of scientific uncertainties was unable to change general beliefs about the nature of science. However, it had no detrimental effect on the trust in scientists, and with respect to interest in science and new technologies, slightly positive effects were observed."

Lyn Gattis

Usability studies

How hard can it be to place a ballot into a ballot box? Usability of ballot boxes in tamper resistant voting systems

Belton, M. G., Kortum, P., & Acemyan, C. Z. (2015). *Journal of Usability Studies, 10,* 129–139. [doi: none]

"End-to-end verifiable voting methods are an emerging type of voting system, and a number of new designs are being actively developed. Many of these systems try to mirror current paper voting methods and use a paper ballot that can be scanned and then placed into a ballot box. Previous research has shown that having separate scanner and ballot box components lead to failures, as many users fail to either scan or place their ballot in the box, both of which are required to cast a vote that will be counted. In [this] study, [the authors] examined the usability of two different ballot box configurations designed to eliminate these kinds of errors. Results showed that both configurations were equally usable, but that specific design aspects of the scanner itself significantly affected the ability of voters to cast their votes, with only 37.5% of the voters able to do so. Based on the results of this research, implications for usable ballot box design are discussed."

Ginnifer Mastarone

Investigating the usability of e-textbooks using the technique for human error assessment

Jardina, J. R., & Chaparro, B. S. (2015). *Journal of Usability Studies, 10,* 140–159. [doi: none]

"Many schools and universities are starting to offer e-textbooks as an alternative to traditional paper

textbooks; however, limited research has been done in this area to examine their usability. This study aimed to investigate the usability of eight e-textbook reading applications on a tablet computer using the Technique for Human Error Assessment (THEA). The tasks investigated are typical of those used by college students when reading a textbook (bookmarking, searching for a word, making a note, and locating a note). Recommendations for improvement of the user experience of e-textbook applications are discussed along with tips for usability practitioners for applying THEA."

Ginnifer Mastarone

Learning to use, useful for learning: A usability study of Google Apps for education

Brown, M. E., & Hocutt, D. L. (2015). *Journal of Usability Studies, 10,* 160–181. [doi: none]

"Using results from an original survey instrument, this study examined student perceptions of how useful Google Apps for Education (GAFE) was in students' learning of core concepts in a first-year college composition course, how difficult or easy it was for students to interact with GAFE, and how students ranked specific affordances of the technology in terms of its usability and usefulness. Students found GAFE relatively easy to use and appreciated its collaborative affordances. The researchers concluded that GAFE is a useful tool to meet learning objectives in the college composition classroom."

Ginnifer Mastarone

Writing

Writing entrepreneurs: A survey of attitudes, habits, skills, and genres

Spartz, J. M., & Weber, R. P. (2015). *Journal of Business and Technical Communication, 29,* 428–455. doi: 10.1177/1050651915588145

"This article presents data from an electronic survey asking 101 entrepreneurs in Wisconsin and North Alabama about the documents they write before opening and while operating their businesses, the writing skills they value, and the audiences they consider when writing. The results demonstrate that entrepreneurs highly value writing and rhetorical skills, produce a huge range of documents, and require distinctive genres at different stages of their ventures. The results can help professional communication instructors, entrepreneurship and small-business consultants, and aspiring entrepreneurs to more effectively anticipate and meet the rhetorical challenges of opening and operating a business."

Sean C. Herring